Author tshingombe tshitadi

Curriculum assessment:

Career Education Didactic Report

Author: Tshingombe Tshitadi Theme: Curriculum Assessment in Trade & Engineering Education

🕮 Overview

This report examines the integration of career education materials, award certificates, diplomas, prizes, and innovative didactic systems within trade and engineering education. It emphasizes curriculum assessment, learner evaluation, and audit-ready documentation.

📚 Scope

- Trade and engineering education at advanced levels
- Credentialing systems: certificates, diplomas, prizes
- Didactic materials: quizzes, evaluation rubrics, learner dashboards
- Innovation and invention recognition in wholesaler and technical contexts

📝 Abstract

Career education thrives when didactic rigor, credentialing, and innovation are combined. This report explores curriculum assessment frameworks, management systems, and audit principles to ensure transparent learner recognition and sustainable educational reform.

🎯 Purpose

- To evaluate career education materials and credentialing systems
- To design audit-ready certificates and diplomas
- To integrate innovation and invention into trade wholesaler education
- To establish transparent quiz and mark evaluation systems

🔑 Keywords

Career education, didactic report, award certificate, diploma, prize, innovation, invention, trade engineering, wholesaler, quiz, evaluation, curriculum assessment, audit, management system.

📄 Description

The report describes how career education materials can be structured into audit-ready frameworks, ensuring learners receive visible recognition through certificates, diplomas, and prizes. It highlights innovation in trade engineering and wholesaler systems.

⚠ Problematic

- Lack of standardized credentialing across trade education
- Limited recognition of innovation and invention in curricula
- Inconsistent evaluation methods and mark allocation
- Weak audit systems for compliance and transparency

📄 Statement Report

This report asserts that career education must integrate didactic rigor, credentialing, and innovation recognition to empower learners and align with regulatory frameworks.

📑 Management System Information

- Learner dashboards for progress tracking
- Digital credentialing systems (badges, certificates, transcripts)
- Audit-ready documentation aligned with councils and authorities

🔍 Principle Investigation

- Alignment of curriculum with regulatory standards
- Evaluation of innovation in trade wholesaler education
- Transparency in quiz and mark evaluation systems

Method Research

- Comparative analysis of credentialing frameworks
- Case studies of trade engineering education
- Surveys of learner and educator experiences
- Audit of management systems for compliance

✅ Advantages

- Transparent credentialing and recognition
- Motivation through prizes and innovation awards
- Audit-ready documentation for compliance
- Learner empowerment via gamified dashboards

❌ Disadvantages

- High administrative burden for audit systems
- Risk of over-standardization limiting creativity
- Resource-intensive management systems

📄 Management System Information (Expanded)

- Integration of LMS with credentialing dashboards
- Automated quiz banks and evaluation rubrics
- Secure audit trails for certificates and diplomas

📊 Conclusion

Career education in trade and engineering requires a balance of didactic rigor, credentialing, and innovation recognition. Audit-ready systems ensure transparency, while prizes and certificates motivate learners to achieve and invent.

💼 Audit

- Verification of certificate and diploma authenticity
- Compliance with national and international councils
- Continuous monitoring of learner progress and evaluation systems

📚 Bibliographic (Sample References)

- Council on Higher Education (CHE) guidelines
- Engineering Council of South Africa (ECSA) standards
- UNESCO TVET frameworks
- International Journal of Technical Education & Training

This structure gives you a **complete academic-style report** that can be adapted into curriculum assessment documentation, certificate design, or audit frameworks.

Would you like me to **expand this into a polished certificate/diploma template** (with placeholders for learner details, marks, and achievements), or into a **sample quiz bank with evaluation rubrics** to demonstrate the assessment system? Both would make this report more tangible.

Career Education Didactic Report

Author: Tshingombe Tshitadi Focus: Curriculum Assessment, Credentialing, and Innovation in Trade & Engineering Education

🎓 Introduction

- **Purpose**: To evaluate career education pathways in engineering and trade wholesaling.
- **Scope**: Didactic materials, award certificates, diplomas, and innovative credentialing systems.
- **Audience**: Educators, regulators, learners, and trade professionals.

📘 Career Education Material

- **Curriculum frameworks**: Structured modules aligned with regulatory standards.
- **Didactic tools**: Manuals, digital dashboards, and gamified learning aids.
- **Assessment artifacts**: Exam banks, mark evaluation rubrics, and learner progress trackers.

🎖️ Award Certificates & Diplomas

- **Certificates**: Audit-ready recognition of short courses and trade skills.
- **Diplomas**: Advanced qualifications in engineering and wholesaling.
- **Prizes & innovation awards**: Incentives for invention, creativity, and applied trade solutions.

⚙️ Innovation & Invention in Trade Engineering

- **Applied projects**: Learners design trade solutions with engineering principles.
- **Wholesaler focus**: Advanced logistics, compliance, and technical distribution.
- **Recognition**: Badges, medals, and certificates linked to innovation outcomes.

📊 Quiz, Marking & Evaluation

- **Quiz banks**: Modular, randomized question sets for fair assessment.
- **Mark evaluation**: Weighted rubrics ensuring transparency and compliance.
- **Feedback loops**: Learner dashboards showing achievement, gaps, and progression.

📝 Curriculum Assessment

- **Alignment**: Mapping outcomes to national and international standards.

- **Moderation**: Ensuring fairness, inclusivity, and audit readiness.
- **Continuous improvement**: Iterative updates to reflect trade and engineering innovations.

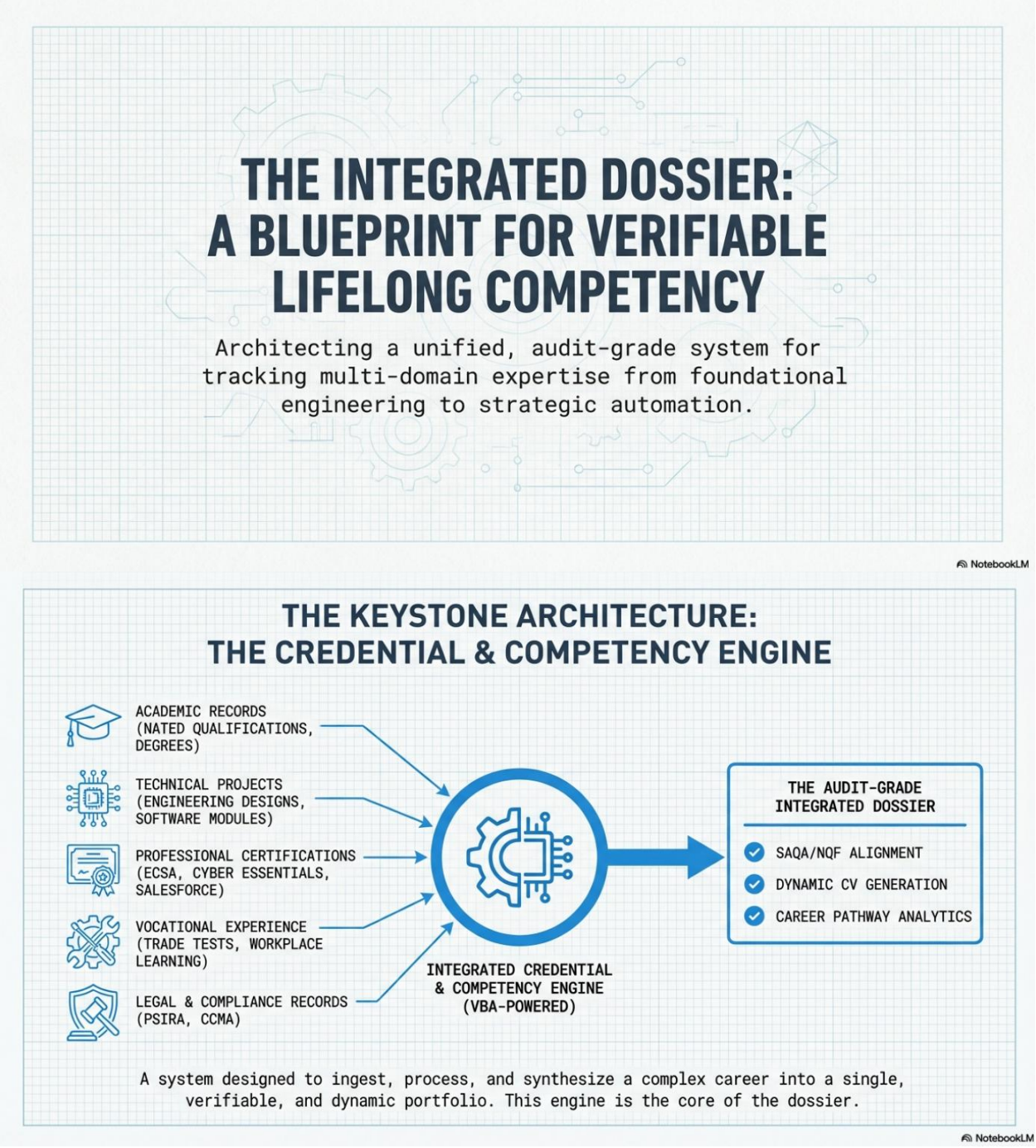
🌍 Conclusion

Career education in trade and engineering thrives when **didactic rigor**, **credentialing systems**, and **innovation recognition** are integrated. Certificates, diplomas, and prizes not only validate achievement but also inspire learners to invent, innovate, and contribute to global wholesaling and engineering systems.

This structure gives you a **report-style document** that can double as curriculum assessment material and a foundation for award certificate/diploma design.

Would you like me to expand this into a **sample award certificate layout** (with placeholders for learner names, marks, and achievements), or into a **quiz bank** that demonstrates the evaluation framework? Both would make your curriculum assessment more tangible.

☞ Do you prefer me to build out sample certificate and diploma templates or quiz and evaluation examples?


THE INTEGRATED DOSSIER:
A BLUEPRINT FOR VERIFIABLE LIFELONG COMPETENCY
Architecting a unified, audit-grade system for tracking multi-domain expertise from foundational engineering to strategic automation.
NotebookLM
THE KEYSTONE ARCHITECTURE:
THE CREDENTIAL & COMPETENCY ENGINE
ACADEMIC RECORDS (NATED QUALIFICATIONS, DEGREES)
TECHNICAL PROJECTS (ENGINEERING DESIGNS, SOFTWARE MODULES)
PROFESSIONAL CERTIFICATIONS (ECSA, CYBER ESSENTIALS, SALESFORCE)
VOCATIONAL EXPERIENCE (TRADE TESTS, WORKPLACE LEARNING)
LEGAL & COMPLIANCE RECORDS (PSIRA, CCMA)
INTEGRATED CREDENTIAL & COMPETENCY ENGINE (VBA-POWERED)
THE AUDIT-GRADE INTEGRATED DOSSIER
SAQA/NQF ALIGNMENT
DYNAMIC CV GENERATION
CAREER PATHWAY ANALYTICS
A system designed to ingest, process, and synthesize a complex career into a single, verifiable, and dynamic portfolio. This engine is the core of the dossier.
NotebookLM

Module 01: The Engineering & Physics Core

Demonstrating mastery over foundational electrotechnical principles as the bedrock of the entire system.

NATED N1-N6 QUALIFICATION FRAMEWORK

- Electrical Trade Theory
- Industrial Electronics
- Engineering Science & Mathematics
- Electrotechnics & Control Systems

CORE TECHNICAL COMPETENCIES

- **Circuit Design & Analysis:** Resistive, Inductive, Capacitive, and Mixed circuits using Kirchhoff's & Ohm's Laws.
- **AC/DC Machines & Transformers:** Principles of operation, testing, and maintenance.
- **High Voltage Engineering:** Principles, equipment, and testing methodologies for power transmission.
- **Smart Grids & IoT Applications:** Integrating IoT for efficiency and sustainability.

How Engineering Knowledge Becomes an Auditable Credential: Every qualification, from N1 theory to practical trade tests, is logged as a foundational entry in the Integrated Dossier.

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Module 02: The Analytical Engine — Modeling with Calculus

Applying integral and differential calculus to model project management, renewable energy systems, and infrastructure design, transforming abstract processes into quantifiable metrics.

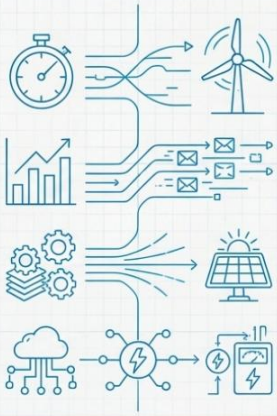
PROJECT & RESOURCE MANAGEMENT

Total Project Time:
$$T = \int_0^N t_i \, di$$

Rate of Task Completion:
$$dN/dt$$

Total Resource Allocation:
$$R = \int_0^T r(t) \, dt$$

Cumulative Risk Impact:
$$I = \int_0^T i(t) \, dt$$



RENEWABLE ENERGY & SMART SYSTEMS

Wind Energy Harvested:
$$E = \int_0^T \frac{1}{2} \rho A v^3 \eta \, dt$$

Solar Rate of Generation:
$$dE/dt = P(t)$$

IoT Data Collected:
$$D_{total} = \int_0^T d(t) \, dt$$

Smart Grid Energy Savings:
$$E_{total} = \int_0^T (E_{conventional} - E_{smart}) \, dt$$

These mathematical models provide a quantitative, evidence-based layer for assessing project efficiency and impact, with results logged as performance metrics in the Dossier.

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Module 03: The Automation Engine — Systemizing with VBA

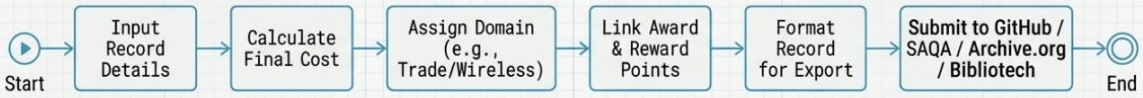
A purpose-built VBA engine automates record-keeping, standardizes data entry, and enforces logical workflows, ensuring the integrity and consistency of the Integrated Dossier.

The Core Data Structure

```
' Module: SpatialLegalCredentialDashboard
Type CredentialRecord
    DateStamp As Date          SalePrice As Currency    Award As String
    Institution As String      Amendment As Currency    LibraryUsageHours As Double
    Item As String             FinalCost As Currency    Notes As String
    SalePrice As Currency
End Type
```

This code is the engine that drives the system, transforming raw data into structured, auditable entries for submission to bodies like SAQA, ECSA, and international credentialing archives.

The Logic Flow (Logigramme)



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The Synthesis: An Audit-Grade, Credential-Linked Record Book

Credential-Linked Record Book – Tableaux Line Format (Snapshot)

Date	Institution/ Platform	Item/ Module	Sale Price	Amendment	Final Cost	Award/ Certificate	Library Usage	Notes/Integration Points
2025-10-08	Sci-Bono Discovery Centre	Electrical Wiring Kit	R450	-R150	R300	Basic Electrical Safety	3h	SAQA/NQF Level 4, WA Code EA2
2025-10-08	ECSA / Home Affairs	Engineer Registration	R1,500	-R500	R1,000	Registered Professional Engineer	4h	CCMA + Master Court archive
2025-10-08	Schneider Electric	Smart Panel	R12,000	-R2,000	R10,000	Energy Mgmt Compliance	3h	GitLab + Azure DevOps billing portal
2025-10-08	SASSETA / CCMA	Labour Law Training	R1,200	-R400	R800	Workplace Dispute Resolution	3h	MERSETA + Home Affairs compliance log
2025-10-08	Atlantic Intl. University	MBM302 Master Thesis Review	$450	-$150	$300	Master of Eng. Systems – Thesis Accepted	6h	IJETR3156 – Accepted, LMS + AIU Library
2025-10-08	GitHub / Azure DevOps	CI/CD Pipeline Subscription	$120	-$60	$60	Trailblazer Superbadge – Data Cloud	4h	GitLab audit log

Each line represents a synthesized event, linking financial data, academic awards, and compliance metadata into a single, traceable record. This is the primary output of the Competency Engine.

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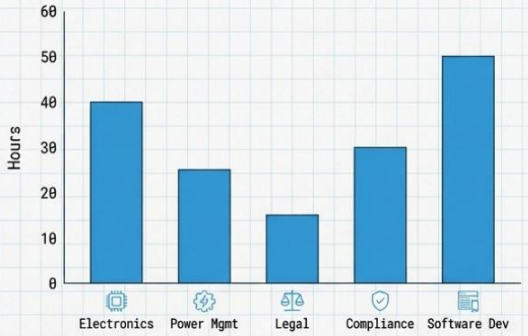
From Record-Keeping to Insight Generation: Portfolio Analytics

The structured data within the Dossier enables quantitative analysis of professional development activities, costs, and outcomes.

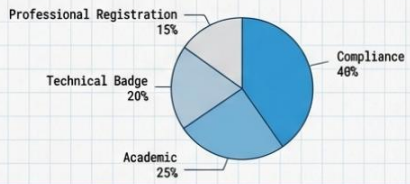
Library Usage by Domain (Hours)



Total Cost Analysis by Category

Category	Total Sale Price	Total Amendment	Net Cost
Education	R800	-R190	R810
Engineering Systems	$570	-$190	$580
Energy Compliance	R15,200	-R2,800	R13,400

Award Distribution by Type



The system enables analysis of resource allocation, cost efficiency, and the balance of competencies across a career.

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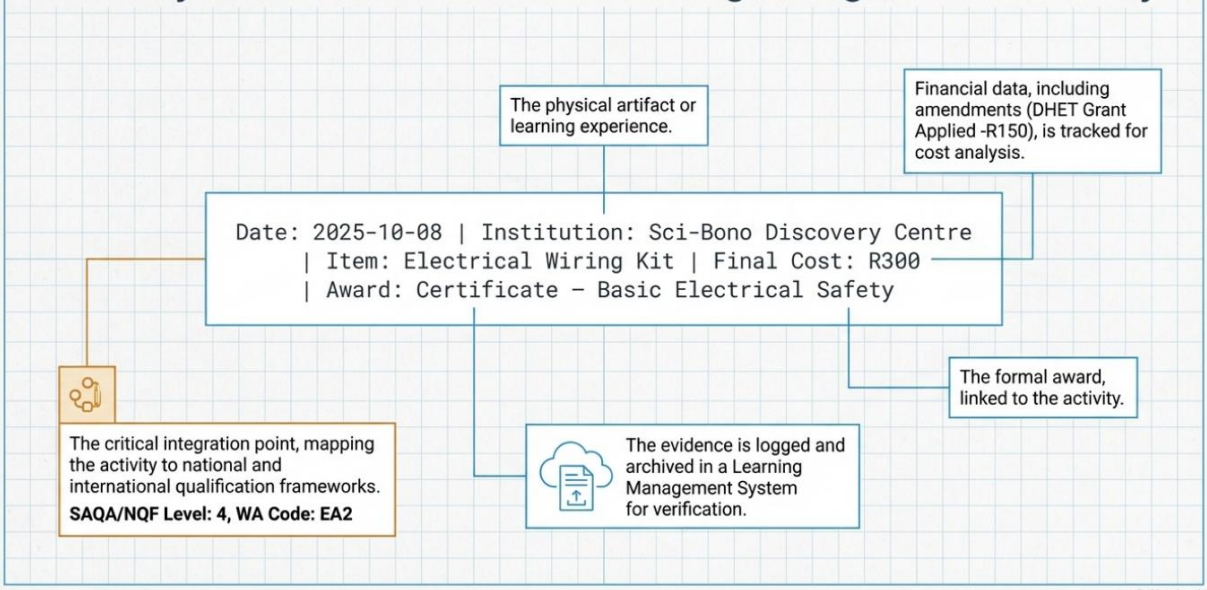
Anatomy of a Credential: Deconstructing a Single Portfolio Entry


The physical artifact or learning experience.
Financial data, including amendments (DHET Grant Applied -R150), is tracked for cost analysis.
Date: 2025-10-08 | Institution: Sci-Bono Discovery Centre | Item: Electrical Wiring Kit | Final Cost: R300 | Award: Certificate – Basic Electrical Safety
The formal award, linked to the activity.
The critical integration point, mapping the activity to national and international qualification frameworks.
SAQA/NQF Level: 4, WA Code: EA2
The evidence is logged and archived in a Learning Management System for verification.

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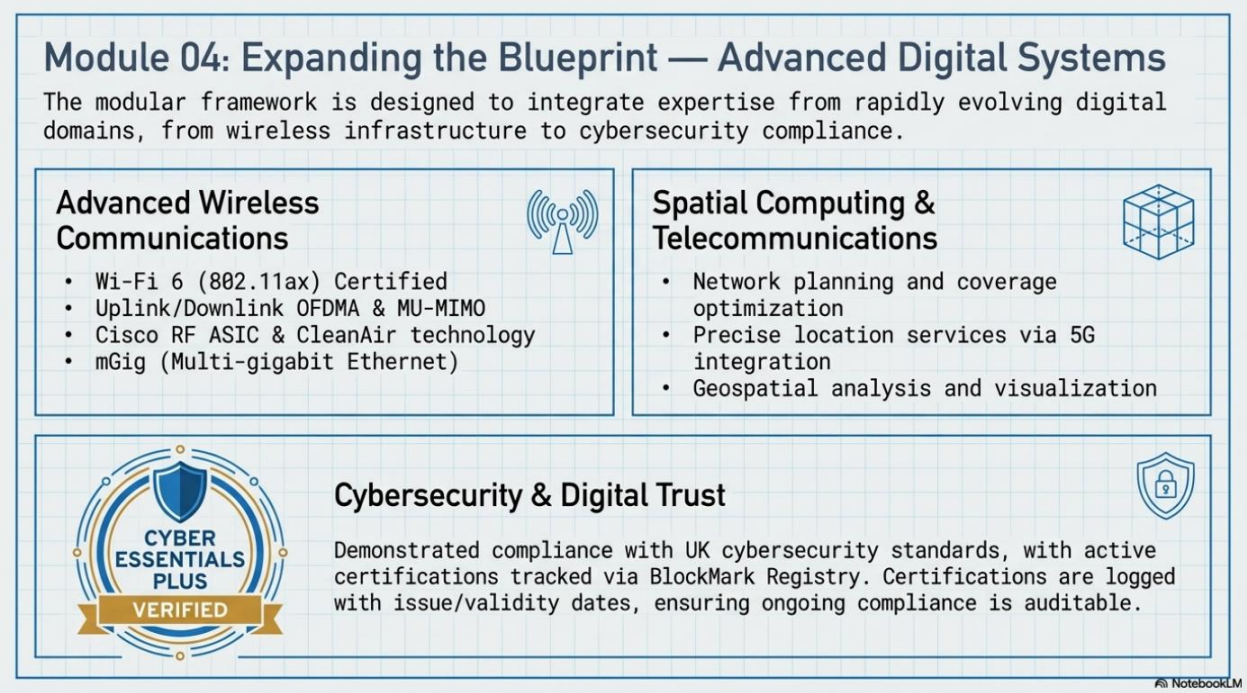
Module 04: Expanding the Blueprint — Advanced Digital Systems
The modular framework is designed to integrate expertise from rapidly evolving digital domains, from wireless infrastructure to cybersecurity compliance.
Advanced Wireless Communications
• Wi-Fi 6 (802.11ax) Certified
• Uplink/Downlink OFDMA & MU-MIMO
• Cisco RF ASIC & CleanAir technology
• mGig (Multi-gigabit Ethernet)
Spatial Computing & Telecommunications
• Network planning and coverage optimization
• Precise location services via 5G integration
• Geospatial analysis and visualization
CYBER ESSENTIALS PLUS
VERIFIED
Cybersecurity & Digital Trust
Demonstrated compliance with UK cybersecurity standards, with active certifications tracked via BlockMark Registry. Certifications are logged with issue/validity dates, ensuring ongoing compliance is auditable.
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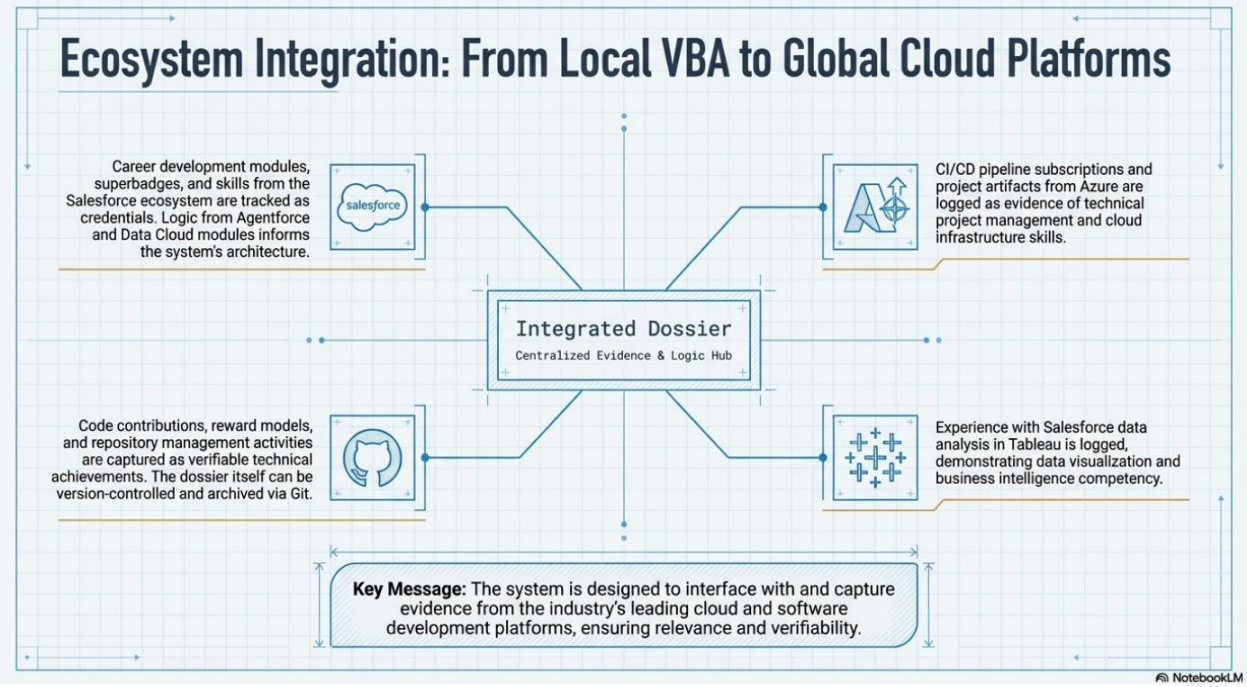
Ecosystem Integration: From Local VBA to Global Cloud Platforms
Career development modules, superbadges, and skills from the Salesforce ecosystem are tracked as credentials. Logic from Agentforce and Data Cloud modules informs the system's architecture.
CI/CD pipeline subscriptions and project artifacts from Azure are logged as evidence of technical project management and cloud infrastructure skills.
Integrated Dossier
Centralized Evidence & Logic Hub
Code contributions, reward models, and repository management activities are captured as verifiable technical achievements. The dossier itself can be version-controlled and archived via Git.
Experience with Salesforce data analysis in Tableau is logged, demonstrating data visualization and business intelligence competency.
Key Message: The system is designed to interface with and capture evidence from the industry's leading cloud and software development platforms, ensuring relevance and verifiability.
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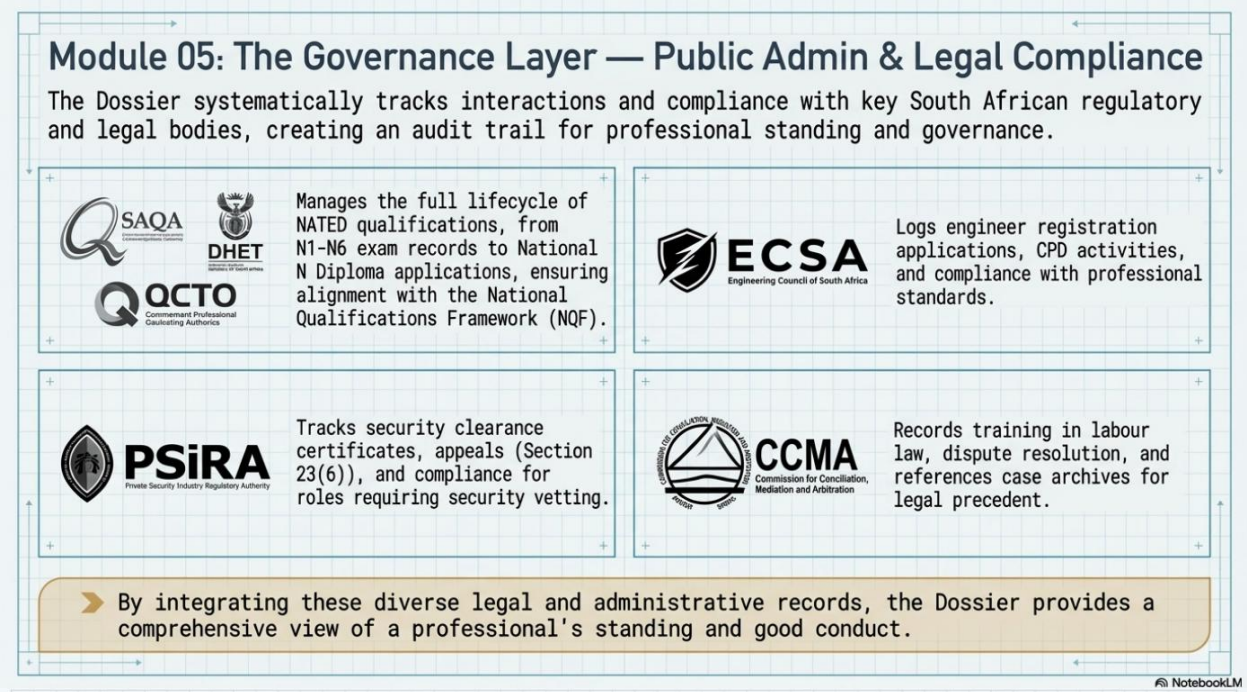
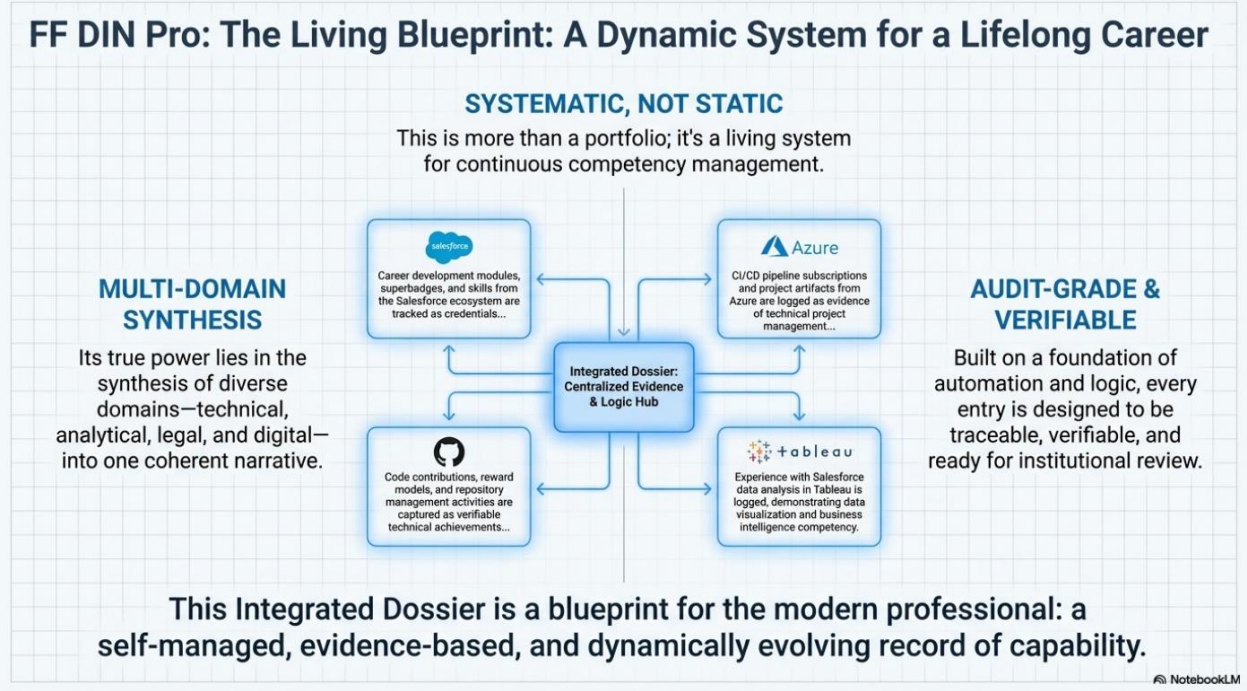

Module 05: The Governance Layer — Public Admin & Legal Compliance
The Dossier systematically tracks interactions and compliance with key South African regulatory and legal bodies, creating an audit trail for professional standing and governance.
SAQA
DHET
QCTO
Commensurate Professional Caulicating Authorics
Manages the full lifecycle of NATED qualifications, from N1-N6 exam records to National N Diploma applications, ensuring alignment with the National Qualifications Framework (NQF).
ECSA
Engineering Council of South Africa
Logs engineer registration applications, CPD activities, and compliance with professional standards.
PSiRA
Private Security Industry Regulatory Authority
Tracks security clearance certificates, appeals (Section 23(6)), and compliance for roles requiring security vetting.
CCMA
Commission for Conciliation, Mediation and Arbitration
Records training in labour law, dispute resolution, and references case archives for legal precedent.
By integrating these diverse legal and administrative records, the Dossier provides a comprehensive view of a professional's standing and good conduct.
NotebookLM


FF DIN Pro: The Living Blueprint: A Dynamic System for a Lifelong Career
SYSTEMATIC, NOT STATIC
This is more than a portfolio; it's a living system for continuous competency management.
MULTI-DOMAIN SYNTHESIS
Its true power lies in the synthesis of diverse domains—technical, analytical, legal, and digital—into one coherent narrative.
salesforce
Career development modules, superbadges, and skills from the Salesforce ecosystem are tracked as credentials...
Azure
CI/CD pipeline subscriptions and project artifacts from Azure are logged as evidence of technical project management...
Integrated Dossier: Centralized Evidence & Logic Hub
Code contributions, reward models, and repository management activities are captured as verifiable technical achievements...
+ableau
Experience with Salesforce data analysis in Tableau is logged, demonstrating data visualization and business intelligence competency.
AUDIT-GRADE & VERIFIABLE
Built on a foundation of automation and logic, every entry is designed to be traceable, verifiable, and ready for institutional review.
This Integrated Dossier is a blueprint for the modern professional: a self-managed, evidence-based, and dynamically evolving record of capability.
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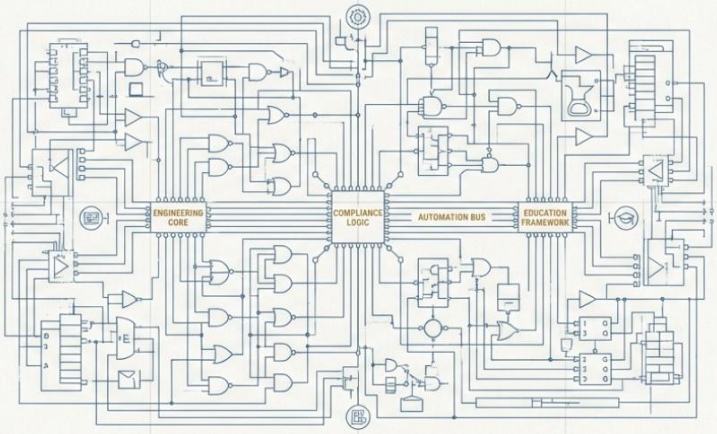
The Integrated Competency Engine: An Architectural Blueprint for a Multi-Domain Career



A unified system for managing credentials, projects, and evidence across engineering, legal, and educational frameworks, automated through a custom VBA-driven logic core.

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Navigating the Modern Matrix of Compliance and Competency

The modern technical career demands auditable mastery across siloed domains. Professionals must manage a portfolio of evidence that satisfies diverse and rigorous standards from bodies such as:

Qualification Authorities

SAQA (South African Qualifications Authority), DHET (Department of Higher Education and Training), QCTO.

Engineering Councils

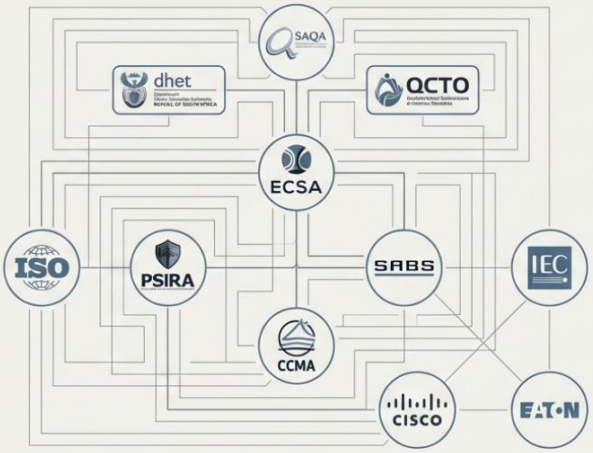
ECSA (Engineering Council of South Africa).

Regulatory & Legal Bodies

PSIRA (Private Security Industry Regulatory Authority), CCMA (Commission for Conciliation, Mediation and Arbitration), SABS.

International Standards

ISO, IEC, Cisco, Eaton.



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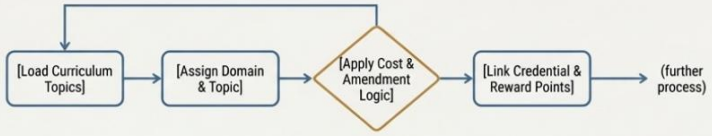
The Solution is a System: Architected with Logigrams, Powered by Code

Core Concept 1: Logigram

A visual logic map defining the relationships and pathways between qualifications, projects, and evidence. It provides the "why". Source Serif Pro Regular.

Core Concept 2: Algorigram

The procedural rule-set that governs the system's operation. It provides the "how".



Core Concept 3: Automation Engine

A suite of Visual Basic for Applications (VBA) modules that executes the algorigrams, manages the data, and generates auditable outputs.

```
Type CredentialRecord
    DateStamp As Date
    Institution As String
    Item As String
    SalePrice As Currency
    Amendment As Currency
    FinalCost As Currency
    Award As String
End Type
```

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A System Fluent in Both Calculus and Code

The Language of Engineering Principles

Modeling Project Dynamics with Calculus

The system uses integral and derivative calculus to model and track key project management vectors.

Project Planning

Total Time: $T = \int_0^N t_i \, d_i$

Task Completion Rate: $\frac{dN}{dt}$

Resource Management

Total Allocation: $R = \int_0^T r(t) \, dt$

Utilization Rate: $\frac{dR}{dt}$

Risk Management

Cumulative Impact: $I = \int_0^T i(t) \, dt$

The Language of Automation

Executing Logic with Visual Basic

Core functions translate principles into repeatable actions, ensuring data integrity and auditability.

```
' Function to calculate final cost
Function CalculateFinalCost(salePrice As Currency,
amendment As Currency) As Currency
    CalculateFinalCost = salePrice + amendment
End Function

' Function to evaluate eligibility based on rules
Function EvaluateEligibility(FastTrack As String,
PriorAward As String) As String
    If FastTrack = "No" And PriorAward = "No" Then
       EvaluateEligibility = "Standard Review Path"
    Else
       EvaluateEligibility = "Fast-Track or
Reconsideration Path"
    End If
End Function
```

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The Central Nervous System: The Credential-Linked Record Book.

A unified, auditable ledger tracking over 50 credentials and projects across commercial, academic, and regulatory domains. The system manages qualifications, costs, and evidence, linking each entry to institutional and national frameworks like SAQA/NQF.

Date	Institution/ Platform	Item/Module	Sale Price	Amendment	Final Cost	Award/Certificate	Library Usage	Notes/Integration Points
2025-10-08	Shoprite / CNA / Elektor	Elektor Starter Kit	R450	-R90	R360	Electronics Fundamentals	3h	Aligned to SAQA/NQF Level 4
2025-10-08	GitHub	Reward Model Deployment	$120	-$40	$80	Contributor Badge	3h	CI/CD Run, Metadata Indexed
2025-10-08	Schneider Electric	Smart Panel	R12,000	-R2,000	R10,000	Energy Mgmt Compliance	3h	GitLab + Azure DevOps billing portal
2025-10-08	ECSA / Home Affairs	Engineer Registration	R1,500	-R500	R1,000	Registered Professional Engineer	4h	CCMA + Master Court archive
2025-10-08	SASSETA / CCMA	Labour Law Training	R1,200	-R400	R800	Workplace Dispute Resolution	3h	MERSETA + Home Affairs compliance log
2025-10-08	Atlantic International University	MBM302 Master Thesis Review	$450	-$150	$300	Master of Engineering Systems – Thesis Accepted	6h	IJETR3156 – Accepted, LMS + AIU Library

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From Raw Data to Strategic Insight: Analyzing the Portfolio.

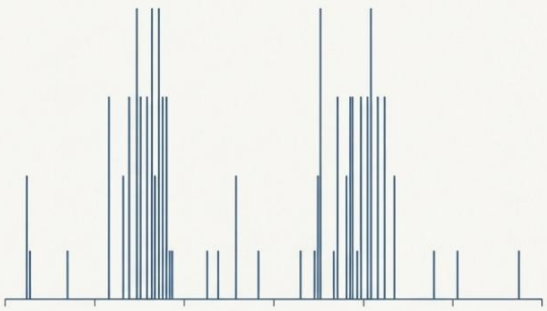
Total Cost Analysis by Category

Category	Total Sale Price	Total Amendment	Total Final Cost	Net Cost
Education	R800	-R190	R610	R810
Engineering Systems	$570	-$190	$380	$580
Energy Compliance	R15,200	-R2,800	R12,400	R13,400

Statistical Award Balance

Award Type	Count	% of Total	Avg Final Cost	Avg Library Usage
Electronics Fundamentals	1	10%	R360	3h
Energy Mgmt Compliance	1	10%	R10,000	3h
Registered Engineer	1	10%	R1,000	4h

Resource Utilization Profile



$$L(t) = \sum_{i=1}^{N} l_i \cdot \delta(t - t_i)$$

Modeling discrete library usage events over time.

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Case Study: Engineering High–Value Infrastructure

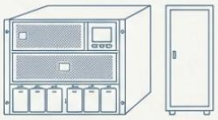
The system maps theoretical knowledge to practical application, managing compliance for complex electrical systems from industrial automation to advanced wireless networking.

Core Curriculum Domains

- Renewable Energy Systems (Wind, Solar, Hydro)
- Smart Grids and IoT Applications
- High Voltage Engineering
- Advanced Wireless Communications (MIMO Systems, Satellite Link Budgets)

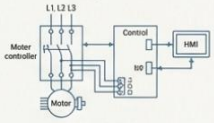
Applied Technology & Compliance

Eaton Power Advantage 9PX UPS



Managing power systems with a final cost of R15,000.

Schneider TeSys T LTMR

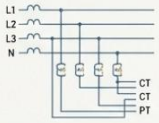


Logigram-validated wiring rules for motor management, mitigating risks like "plunger-only stop".

Cisco Catalyst 9000 Series

Algorigram-driven oversubscription analysis for campus LAN architecture, featuring Wi-Fi 6 (802.11ax), RF ASIC, and mGig capabilities.

ION8650 Metering



Compliance checks for complex wiring configurations like "4Wire WYE, 2 PTs, 3 CTs".

NotebookLM

Case Study: Navigating Legal and Security Frameworks

The engine extends beyond engineering to manage legal evidence, regulatory compliance, and security credentials, ensuring a complete and defensible professional record.

FF DIN Pro Medium Legal & Labour Compliance

CCMA Dispute Resolution: Tracking Labour Law Training (R800 Final Cost) and linking evidence to CCMA hearings.

Learnership Agreements: Managing legal documents like 'Learning Programme Agreement PG 1–150' and handling dispute resolution under Section 18(3).

Pension Funds Adjudicator: Logging formal complaints, referencing case numbers like GP/00096285/2023.

FF DIN Pro Medium Security & Digital Assurance

PSIRA Compliance: Managing clearance certificates under Act 56 of 2001, tracking appeals, and aligning with security service provider requirements.

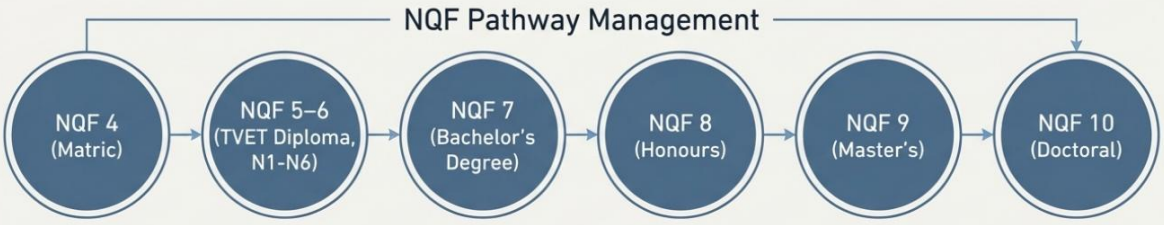
Cyber Essentials Plus Certification: Evidencing digital security competence through BlockMark registry records, with active certification valid to 2025-12-13.

Public Service Applications: Documenting applications for roles like 'Metropolitan Police - Technical Surveillance Unit' and "Counter Terrorism Policing HQ," aligning engineering skills with security needs.

NotebookLM

Case Study: Architecting the Future of Technical Education

The system is not just a portfolio; it's a meta-framework for curriculum design, assessment validation, and alignment with national qualification standards from foundational to postgraduate levels.



Curriculum Content & Pedagogy

- **Subjects:** Electrical Trade Theory, Industrial Electronics, Engineering Science, Mathematics (N1-N6).
- **Didactic Method:** Application of "orthopedagogie material didactic lesson plans".
- **Alignment:** Mapping learning to CAPS curriculum for FET Phase (Grades 10-12 / N1-N3).

Assessment & Moderation

- **Tools:** ICASS (Internal Continuous Assessment), ISAT, Rubrics.
- **Compliance:** Generation of documents for DHET moderation, such as "ANNEXURE S1: Semester Subject Assessment Plan" and "ANNEXURE G6: ICASS Irregularity Register".

NotebookLM

Inside the Engine: A VBA-Powered Audit & Automation Framework

A deep dive into the core technical architecture, revealing how the VBA framework manages data, automates validation, and powers interactive user interfaces.

FF DIN Structure & Classes
Defining the Core Objects

```
' Class: cNode
Public ID As String
Public ParentID As String
Public Title As String
Public Kind As String
Public Meta As Scripting.Dictionary

Private Sub Class_Initialize()
    Set Meta = New Scripting.Dictionary
End Sub
```

The Audit Engine
Automated Validation & Error Scanning

```
' Module: mExpoAudit
Public Sub RunAudit()
    '...'
    Audit_GlobalErrors()
    ValidateCareerPathways()
    '...'
End Sub

Private Sub AddFinding(area$, item$,
issue$, detail$, action$)
    gFindRow = gFindRow + 1
    With Worksheets("Findings")
        .Cells(gFindRow, 1).Value = area
        '...'
    End With
End Sub
```

User Interface Logic
Interactive Dashboards & UserForms

```
' Form: frmLogiAlg
Private Sub UserForm_Initialize()
    '...'
    BuildTree
    '...'
End Sub

Private Sub BuildTree()
    tvNav.Nodes.Clear
    '...'
    tvNav.Nodes.Add , , n.ID,
Prefix(n.Kind) & n.Title
    '...'
End Sub
```

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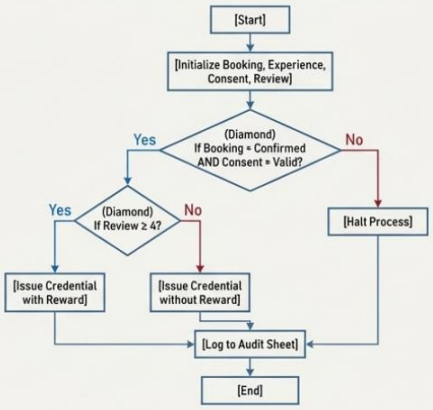
System Interoperability: Integrating with the Salesforce Ecosystem

The Competency Engine is designed to integrate with enterprise platforms, using its logic to automate credential workflows based on data from systems like Salesforce Data Cloud and Trailhead.

VBA Modules for Salesforce Integration

Module Name	Function
`ImportSalesforceData`	Pulls Booking__c, Experience__c, Consent__c data
`CredentialStatusManager`	Tracks issuance, expiry, reward, and amendment.
`ConsentChecker`	Validates `AuthorizationFormConsent` for compliance.
`AuditLogger`	Flags anomalies (e.g., missing consent, low reviews).
`ExportToRegistry`	Prepares credential data for BlockMark or Cyber Essentials.

Algorigram: Credential Issuance Logic



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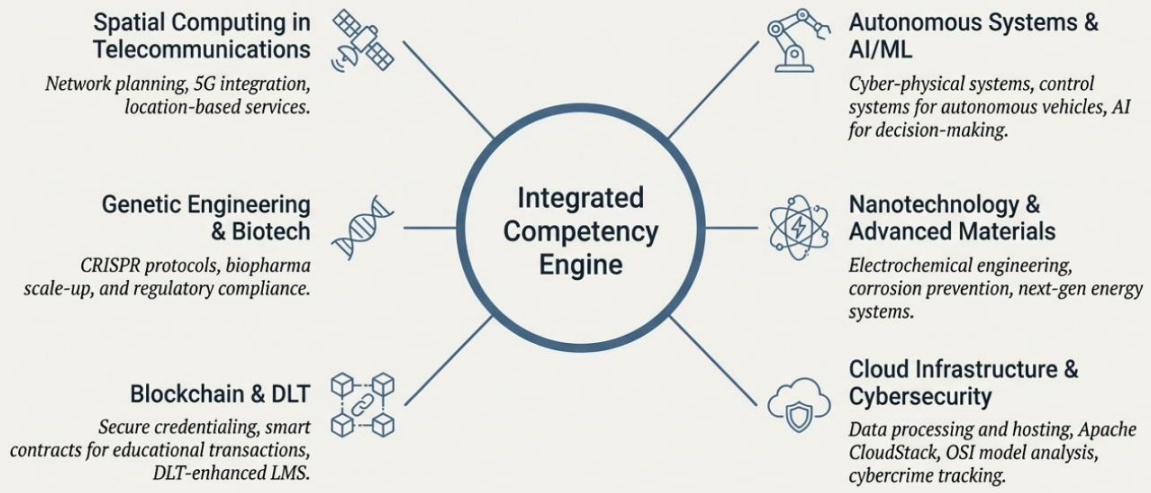
A Unified Framework for 4IR and Advanced Research Domains

The engine's architecture provides a scalable model for integrating and managing knowledge across cutting-edge disciplines, essential for developing a future-ready workforce.


Integrated Competency Engine
Spatial Computing in Telecommunications
Network planning, 5G integration, location-based services.
Genetic Engineering & Biotech
CRISPR protocols, biopharma scale-up, and regulatory compliance.
Blockchain & DLT
Secure credentialing, smart contracts for educational transactions, DLT-enhanced LMS.
Autonomous Systems & AI/ML
Cyber-physical systems, control systems for autonomous vehicles, AI for decision-making.
Nanotechnology & Advanced Materials
Electrochemical engineering, corrosion prevention, next-gen energy systems.
Cloud Infrastructure & Cybersecurity
Data processing and hosting, Apache CloudStack, OSI model analysis, cybercrime tracking.

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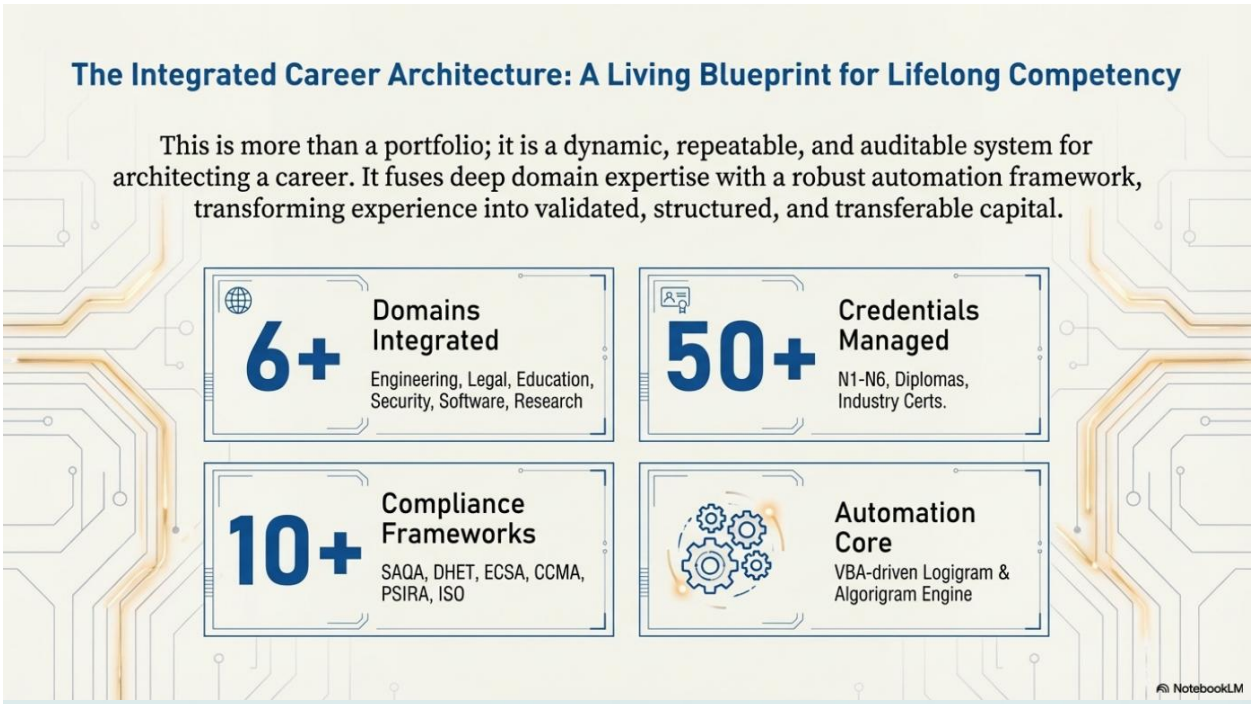
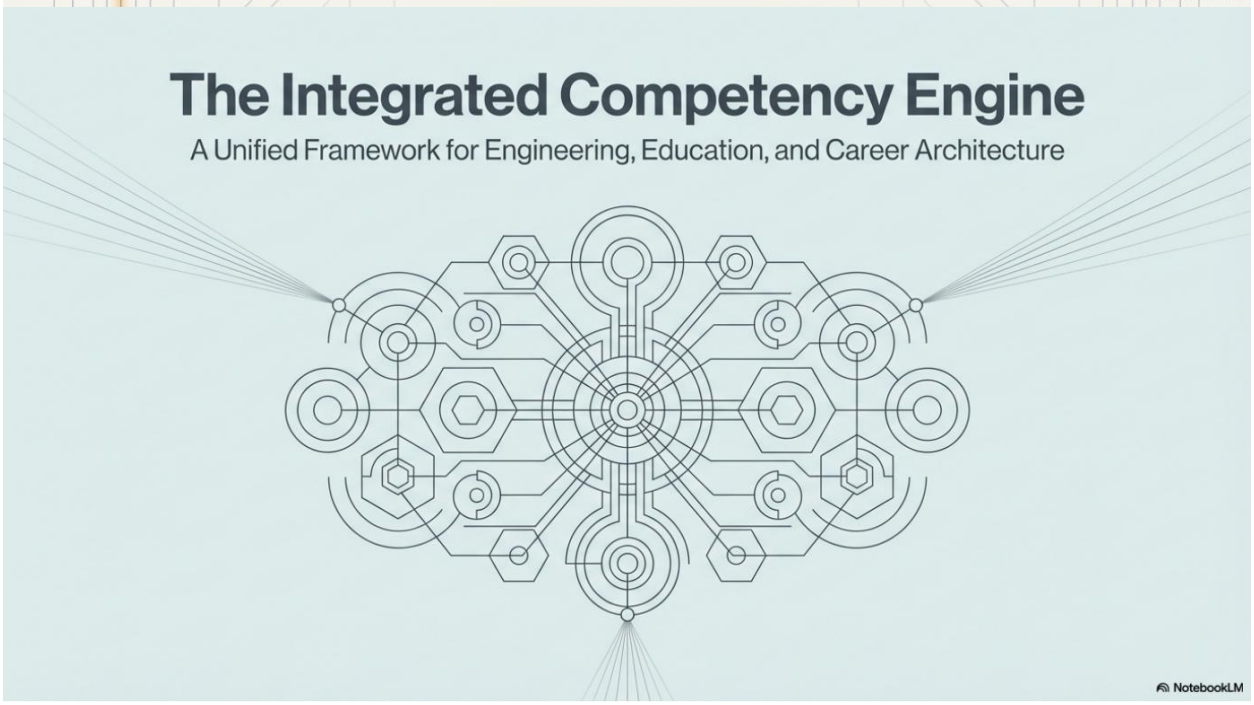
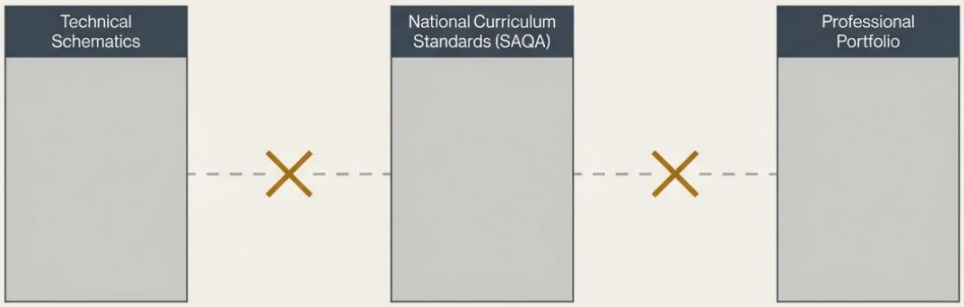

The Integrated Career Architecture: A Living Blueprint for Lifelong Competency
This is more than a portfolio; it is a dynamic, repeatable, and auditable system for architecting a career. It fuses deep domain expertise with a robust automation framework, transforming experience into validated, structured, and transferable capital.
6+
Domains Integrated
Engineering, Legal, Education, Security, Software, Research
50+
Credentials Managed
N1-N6, Diplomas, Industry Certs.
10+
Compliance Frameworks
SAQA, DHET, ECSA, CCMA, PSIRA, ISO
Automation Core
VBA-driven Logigram & Algorigram Engine
NotebookLM


The Integrated Competency Engine
A Unified Framework for Engineering, Education, and Career Architecture
NotebookLM

The Challenge of Siloed Expertise and Unverifiable Skill



Fragmented Systems:
Technical specifications, curriculum standards, and professional credentials exist in isolated, incompatible formats.

Opaque Competencies:
How can we audit the skills acquired from an NQF-aligned course, a workplace project, and a professional certification in a single view?

Static Records:
Traditional CVs and transcripts fail to capture the dynamic, interconnected nature of a modern technical career. They are records of the past, not models for the future.

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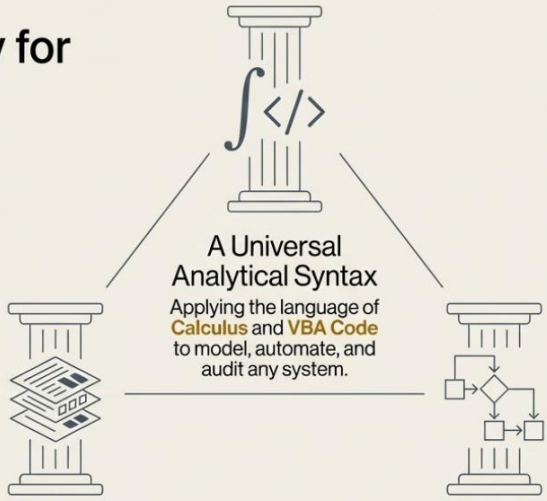
The Solution: A Methodology for Integrated Competence



A Universal Analytical Syntax

Applying the language of **Calculus** and **VBA Code** to model, automate, and audit any system.

Structured Data Frameworks

Capturing every event in a **Credential-Linked Record Book**—from course completion to project deployment.

Procedural Logic Models

Using **Logigrams** and **Algorigrams** to map complex processes, from curriculum flow to diagnostic troubleshooting.

This is a systematic, code-driven approach to creating **auditable** knowledge systems.

NotebookLM

The Syntax of the System: Code and Calculus

Modeling with Calculus

Quantifying Cumulative Effort & Rates of Change

Total Project Time: $T_{\text{total}} = \int_0^N t_i \, di$

Cumulative Risk Impact: $I = \int_0^T i(t) \, dt$

Task Completion Rate: $\frac{dN}{dt}$

Automating with Code (VBA)

Defining the Core Data Structure

```
Type CredentialRecord
    DateStamp As Date
    Institution As String
    Item As String
    SalePrice As Currency
    Amendment As Currency
    FinalCost As Currency
    Award As String
    LibraryUsageHours As Double
    Notes As String
End Type
```

This is the language that connects electrical circuits to curriculum standards and career milestones.

NotebookLM

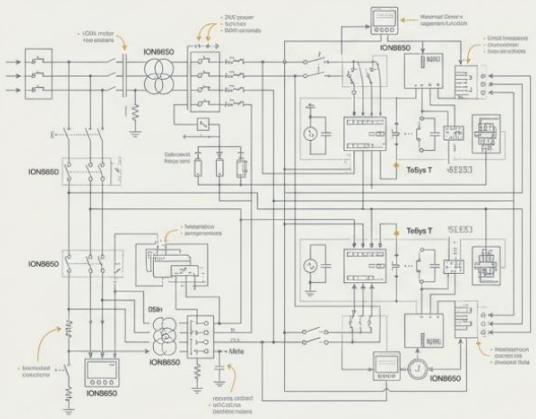
Module 1: Engineering & Technical Systems

How can we deconstruct, audit, and maintain complex electrical infrastructure using a single, coherent logic?

Key Challenges Addressed

Neue Haas Grotesk Display Pro Roman

- Ensuring compliance for advanced hardware (e.g., TeSys T motor managers, ION8650 power meters).
- Validating system behavior against theoretical principles (e.g., Kirchhoff's Laws, Shannon-Hartley Theorem).
- Automating diagnostic and configuration checks to reduce human error.



NotebookLM

Application: Modeling and Auditing a DOL Starter Circuit

Governing Principle

Kirchhoff's Laws: The sum of currents entering a junction equals the sum of currents leaving it.

Audit Algorithm

```
Function EvaluateDOL(plunger As String, rStop As String,
    ByRef note As String) As String
    ' Plunger-only stop risk: If the plunger doesn't actuate
    ' the overload's stop, there's no stop path—flag high risk.
    If UCase$(plunger) = "YES" And UCase$(rStop) <> "YES" Then
        note = "Plunger-only stop is unsafe."
        EvaluateDOL = "Review"
    Else
        note = "Remote/E-Stop in NC chain (A2-96 or 14-95)."
        EvaluateDOL = "OK"
    End If
End Function
```

The engine translates physical wiring logic into an auditable algorithm.

NotebookLM

Outcome: An Audit-Grade Blueprint for Technical Infrastructure

Selected System Specifications

System/Component	Parameter	Specification	Source/Standard
Cisco Catalyst 9800	Key Features	Wi-Fi 6 certified, OFDMA, MU-MIMO, BSS Coloring, Cisco RF ASIC	Manufacturer Spec Sheet
Eaton 9PX UPS	Thermal Dissipation	Online+Charging: 900 BTU/hr; OnBattery: 2000 BTU/hr	DOCA0128EN-02
High Voltage Systems	Channel Capacity	$C = M \cdot B \cdot \log_2(1 + \mathrm{SNR})$	Shannon-Hartley Theorem
Motor Control	Phase Imbalance Trip	Threshold: 10...70 %; Timeout (running): 0.2...20 s	TeSys T LTMR Guide

The engine creates a living, queryable model of physical systems, ensuring every component and behavior is documented and verifiable.

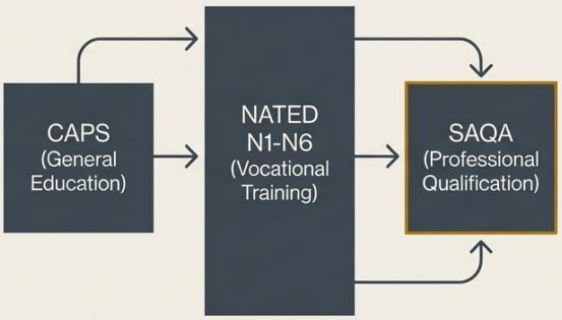
NotebookLM

Module 2: Curriculum & Competency Architecture

How do we transform static syllabi into dynamic, auditable educational frameworks that align with national standards?

Key Challenges Addressed

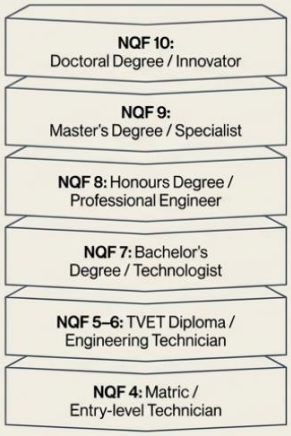
- Mapping learning outcomes to the South African National Qualifications Framework (NQF).
- Ensuring curriculum content is complete, coherent, and logically sequenced.
- Creating a transparent, evidence-based process for assessment and moderation (ICASS).



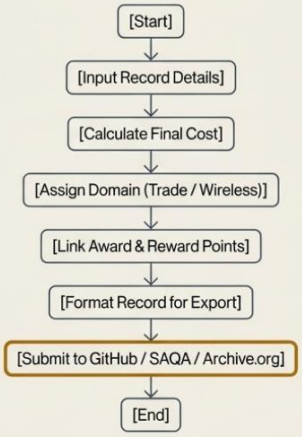
NotebookLM

Application: Structuring the National Qualifications Framework

NQF Competency Ladder



Credential Flow Logigram



NotebookLM

Outcome: An Automated Engine for Curriculum Quality Assurance

VBA Audit Logic

```
Private Sub ValidateCareerPathways()
    Dim ws As Worksheet: Set ws = Worksheets("CareerPathways")
    Dim r&, lastR&: lastR = ws.Cells(ws.Rows.Count, 1).End(xlUp).Row
    For r = 2 To lastR
        Dim sector$, path$: sector = Trim(ws.Cells(r, 1).Value)
        If Len(sector) = 0 Then
            AddFinding "CareerPathways", "(Row " & r & ")",
                       "Missing Sector", "", "Specify sector"
        End If
    Next r
End Sub
```

Generated Findings

Area	Item	Issue	Action
CurriculumProjects	Project Alpha	Missing Outcome/Metaphor	Describe learning goal
CareerPathways	(Row 4)	Missing Sector	Specify sector
InstitutionalOversight	Teacher Relations	Missing Description	Provide detail

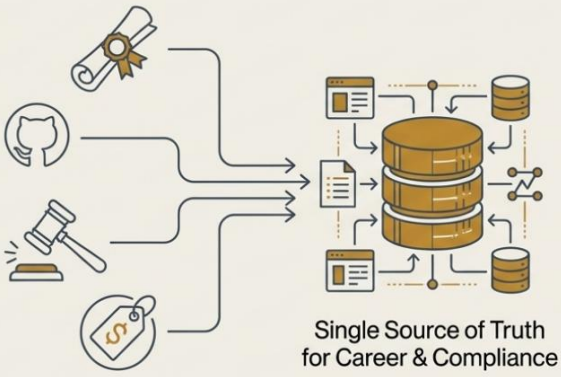
The engine programmatically validates curriculum structure against predefined rules, ensuring alignment and completeness before submission to bodies like DHET and QCTO.

NotebookLM

Module 3: Career & Compliance Ecosystems

How can we integrate formal education, on-the-job training, professional certifications, and legal compliance into a single source of truth?

- Tracking CPD from diverse sources (universities, vendors like Schneider Electric, platforms like GitHub).
- Linking credentials to specific legal and regulatory bodies (ECSA, CCMA, PSIRA).
- Analyzing the financial and time investment across a full career trajectory.



Single Source of Truth for Career & Compliance

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Application: The Credential-Linked Record Book

Date	Institution / Platform	Item / Module	Final Cost	Award / Certificate	Integration Points
2025-10-08	Shoprite / Elektor	Elektor Starter Kit	R360	Electronics Fundamentals	GitHub + SAQA/NQF dashboard
2025-10-08	Schneider Electric	Smart Panel	R10,000	Energy Mgmt Compliance	GitLab + Azure DevOps billing
2025-10-08	ECSA / Home Affairs	Engineer Registration	R1,000	Registered Professional Engineer	CCMA + Master Court archive
2025-10-08	SASSETA / CCMA	Labour Law Training	R800	Workplace Dispute Resolution	MERSETA + Home Affairs log
2025-10-08	Atlantic Intl. University	MBM302 Master Thesis	$300	Master of Eng. – Thesis Accepted	IJETR3156 – Accepted, AIU Library
2025-10-08	GitHub / Azure DevOps	CI/CD Pipeline Sub	$60	Trailblazer Superbadge	GitLab audit log

NotebookLM

The Code Behind the Record: VBA Core Logic

The Data Structure

```
' The core data type for every entry
Type CredentialRecord
    DateStamp As Date
    Institution As String
    Item As String
    SalePrice As Currency
    Amendment As Currency
    FinalCost As Currency
    Award As String
    Notes As String
End Type
```

The Formatting Function

```
' Function to create a standardized, exportable string
Function FormatRecord(entry As CredentialRecord) As String
    FormatRecord = "🗓️ " & entry.DateStamp & " | " & _
      entry.Institution & "  | " & entry.Item & _
      " | ✅ " & FormatCurrency(entry.FinalCost)
End Function
```

Every entry is a structured object, managed and formatted by a consistent set of rules, enabling automated reporting and integration.

NotebookLM

Outcome: Data-Driven Career and Cost Analysis

Total Cost Analysis by Category			Neue Haas Grotesk Display Pro Roman
Category	**Total Sale Price**	**Total Amendment**	**Total Final Cost**
Education	R800	-R190	**R610**
Engineering Systems	$570	-$190	**$380**
Energy Compliance	R15,200	-R2,800	**R12,400**

Statistical Award Balance				Neue Haas Grotesk Display Pro Roman
Award Type	**Count**	**% of Total**	**Avg Final Cost**	**Avg Library Usage**
Electronics Fundamentals	1	10%	R360	3h
Contributor Badge	1	10%	$80	3h
Registered Engineer	1	10%	R1,000	4h

The system provides a quantitative, holistic view of professional investment and achievement over time.

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A New Paradigm: Audit-Grade Human Capital

By integrating technical, educational, and professional data into a single, auditable framework, this methodology creates a unified, verifiable, and dynamic record of human potential and achievement. This is the foundation for the future of talent, compliance, and lifelong learning.

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An Auditable Universe of Competency

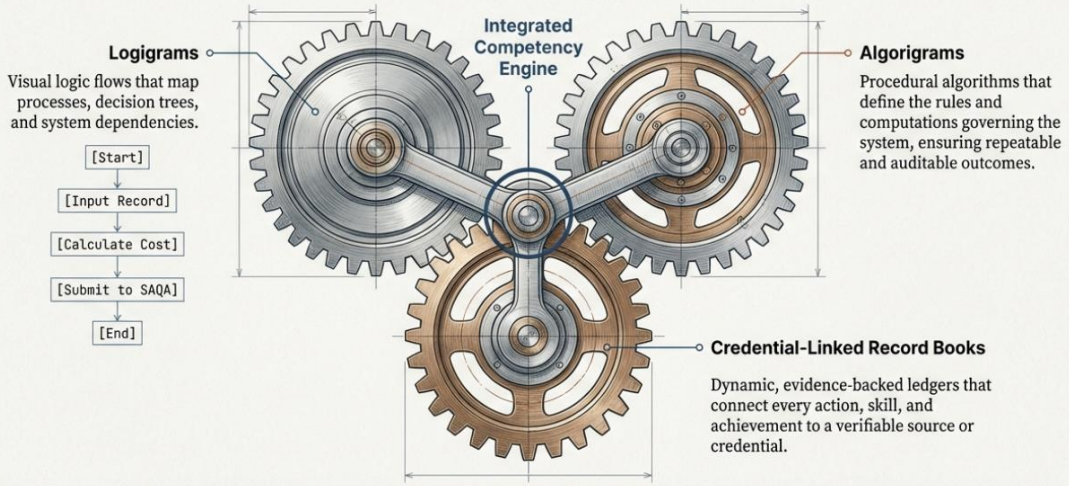
A System for Integrating Technical Knowledge, Curriculum Architecture, and Professional Compliance

Technical Knowledge & Engineering Fundamentals
Curriculum Architecture & Academic Credentials
Professional Compliance & Legal Frameworks

NotebookLM

The Integrated Competency Engine: A Methodology for Provable Knowledge

The system is built on a core methodology for scaffolding, auditing, and integrating complex knowledge domains. It transforms disparate data points into a cohesive, logical, and verifiable ecosystem.


Integrated Competency Engine
Logigrams
Visual logic flows that map processes, decision trees, and system dependencies.
[Start]
[Input Record]
[Calculate Cost]
[Submit to SAQA]
[End]
Algorigrams
Procedural algorithms that define the rules and computations governing the system, ensuring repeatable and auditable outcomes.
Credential-Linked Record Books
Dynamic, evidence-backed ledgers that connect every action, skill, and achievement to a verifiable source or credential.

NotebookLM

The Syntax of the System is Code and Calculus

The Language of Structure (VBA)

```
' Module: SpatialLegalCredentialDashboard
Option Explicit
Type CredentialRecord
    DateStamp As Date
    Institution As String
    Item As String
    SalePrice As Currency
    Amendment As Currency
    FinalCost As Currency
    Award As String
    LibraryUsageHours As Double
    BookingType As String
    Notes As String
End Type
```

Visual Basic for Applications (VBA) provides the architectural backbone, creating structured, repeatable, and automated data handling for every record.

The Language of Dynamics (Calculus)

Project Planning: $T = \int_0^N t_i di$

Rate of Task Completion: $\frac{dN}{dt}$

Renewable Energy Harvest: $E = \int_0^T \frac{1}{2} \rho A v^3 \eta dt$

IoT Data Transmission Rate: $\frac{dD}{dt}$

Calculus is used to model dynamic processes, from project velocity to energy generation, making performance quantifiable and predictable.

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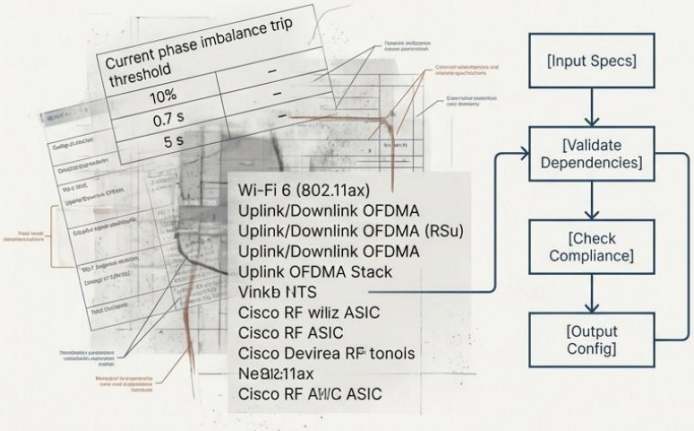
Module 1: Engineering & Technical Systems

Deconstructing Complexity from from Smart Grids to Wireless Networks



The Challenge

Technical systems are defined by dense specifications, interconnected dependencies, and critical compliance standards. Managing this complexity requires a systematic, auditable approach.

The Logic

The Engine applies logigrams and algorigrams to map system architecture, validate configurations, and trace operational logic, making every component and rule explicit.

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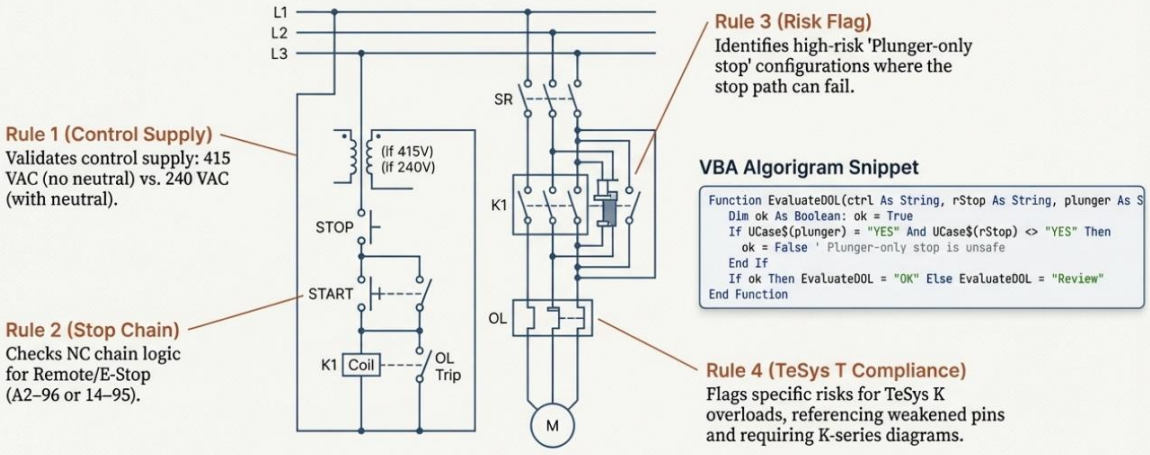
Application: An Auditable Logigram for a DOL Starter


L1
L2
L3
SR
(If 415V)
(If 240V)
STOP
START
K1
Coil
OL
Trip
K1
OL
M
Rule 1 (Control Supply)
Validates control supply: 415 VAC (no neutral) vs. 240 VAC (with neutral).
Rule 2 (Stop Chain)
Checks NC chain logic for Remote/E-Stop (A2–96 or 14–95).
Rule 3 (Risk Flag)
Identifies high-risk 'Plunger-only stop' configurations where the stop path can fail.
VBA Algorigram Snippet
Function EvaluateDOL(ctrl As String, rStop As String, plunger As S
Dim ok As Boolean: ok = True
If UCase$(plunger) = "YES" And UCase$(rStop) <> "YES" Then
ok = False ' Plunger-only stop is unsafe
End If
If ok Then EvaluateDOL = "OK" Else EvaluateDOL = "Review"
End Function
Rule 4 (TeSys T Compliance)
Flags specific risks for TeSys K overloads, referencing weakened pins and requiring K-series diagrams.

This approach transforms a wiring diagram into an interactive diagnostic tool, ensuring safety, compliance, and traceability for every installation.

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Module 2: Curriculum & Competency Architecture

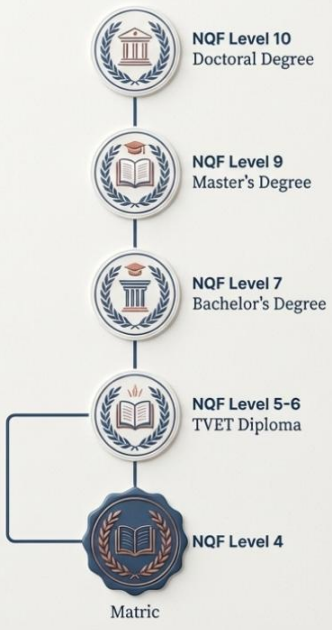
Architecting Verifiable Learning Aligned with National Standards

The Challenge

Educational pathways are often fragmented. Credentials must be transparently linked to specific competencies, aligned with national frameworks (like SAQA/NQF), and auditable by employers and institutions.

The Logic

The Engine uses the 'Credential-Linked Record Book" to create a fine-grained, evidence-based ledger of learning. Each entry is a node in a larger knowledge graph, connecting qualifications to real-world application.



NotebookLM

Application: The Credential-Linked Record Book in Action

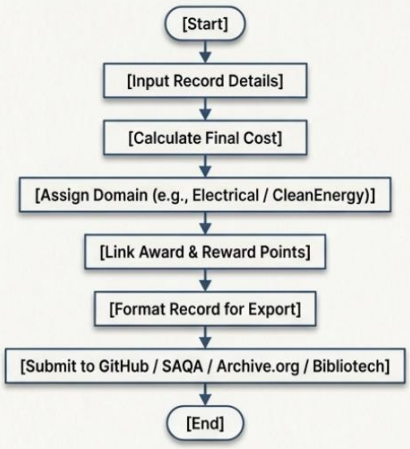
Credential-Linked Record Book (Selected Entries)					
Date	Institution / Platform	Item / Module	Final Cost	Award / Certificate	Notes / Integration Points
2025-10-08	Sci-Bono Discovery Centre	Electrical Wiring Kit	R300	Basic Electrical Safety	SAQA/NQF Level 4, WA Code EA2
2025-10-08	Schneider Electric	Smart Panel	R10,000	Energy Mgmt Compliance	GitLab + Azure DevOps billing portal
2025-10-08	ECSA / Home Affairs	Engineer Registration	R1,000	Registered Professional Engineer	CCMA + Master Court archive
2025-10-08	Atlantic Intl. University	MBM302 Master Thesis Review	$300	Master of Eng. Systems – Thesis Accepted	IJETR3156 – Accepted, LMS + AIU Library
2025-10-08	GitHub / Azure DevOps	CI/CD Pipeline Subscription	$60	Trailblazer Superbadge – Data Cloud	GitLab audit log + Tableau Dashboard
2025-10-08	SASSETA / CCMA	Labour Law Training	R800	Workplace Dispute Resolution	MERSETA + Home Affairs compliance log

Every line item is an auditable event, linking financial investment, time spent (Library Usage), and credentialing outcomes to a specific institutional context and digital proof point (e.g., GitHub, LMS).

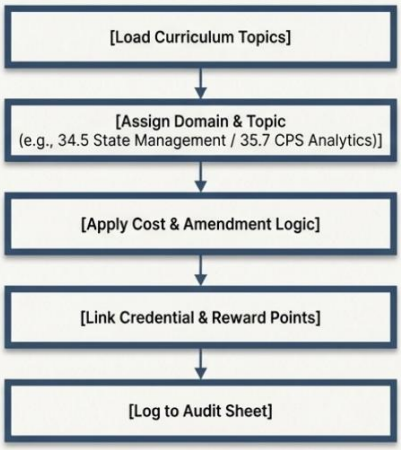
NotebookLM

The Logic of Credential Flow and Curriculum Mapping

Logigramme for Credential Flow


[Start]
[Input Record Details]
[Calculate Final Cost]
[Assign Domain (e.g., Electrical / CleanEnergy)]
[Link Award & Reward Points]
[Format Record for Export]
[Submit to GitHub / SAQA / Archive.org / Bibliotech]
[End]

Algorigramme for Curriculum Logic


[Load Curriculum Topics]
[Assign Domain & Topic
(e.g., 34.5 State Management / 35.7 CPS Analytics)]
[Apply Cost & Amendment Logic]
[Link Credential & Reward Points]
[Log to Audit Sheet]

The system operates on explicit rules. The Logigram defines the 'what happens next' for each credential, while the Algorigram defines the 'how to classify and process' each learning event.

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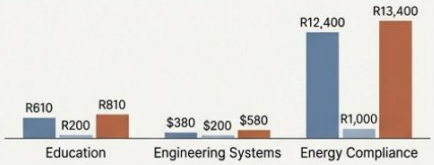
Outcome: From Raw Data to Strategic Insight

Total Cost Analysis



Category	Total Final Cost	Booking Cost	Net Cost
Education	R610	R200	R810
Engineering Systems	$380	$200	$580
Energy Compliance	R12,400	R1,000	R13,400

Statistical Award Balance

Award Type	% of Total	Avg Final Cost	Avg Library Usage
Electronics Fundamentals	10%	R360	3h
Registered Engineer	10%	R1,000	4h
Energy Mgmt Compliance	10%	R10,000	3h

By structuring educational data, the Engine enables powerful analytics on cost, time investment, and competency distribution, turning a learning history into an actionable dashboard.

NotebookLM

Module 3: Career & Compliance Ecosystems

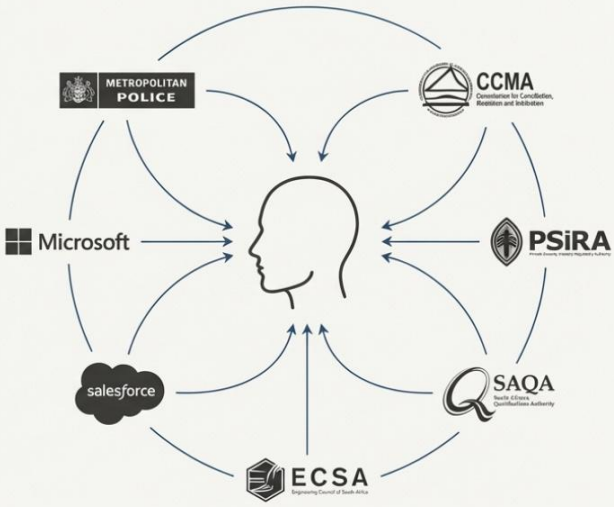
Integrating a Professional Trajectory with Legal and Regulatory Frameworks

The Challenge

A modern career is a complex portfolio of formal jobs, certifications, legal obligations (PSIRA, ECSA), and continuous learning (Salesforce Trailhead). This portfolio must be coherent, verifiable, and compliant.

The Logic

The Engine acts as a master aggregator, ingesting and structuring diverse artifacts—from legal filings and cyber security certificates to job applications and self-assessments—into a unified professional dossier.



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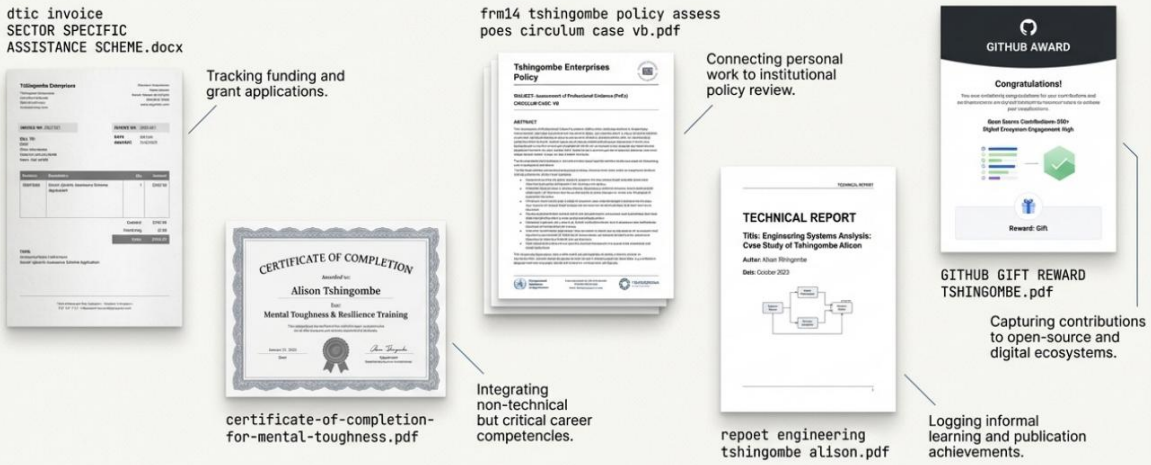
Application: A Multi-Pocket Dossier of Professional Evidence



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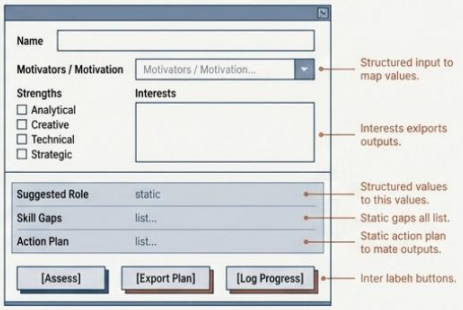
Application: A Tool for Career Exploration and Development

The Engine includes modules for self-assessment, using structured inputs to guide career planning and identify skill gaps, directly referencing methodologies from platforms like Salesforce Trailhead.

The "Get to Know Yourself" Framework

- Knowing what motivates you and what matters in your life
- Identifying your strengths and opportunities to improve
- Finding out what you're most interested in

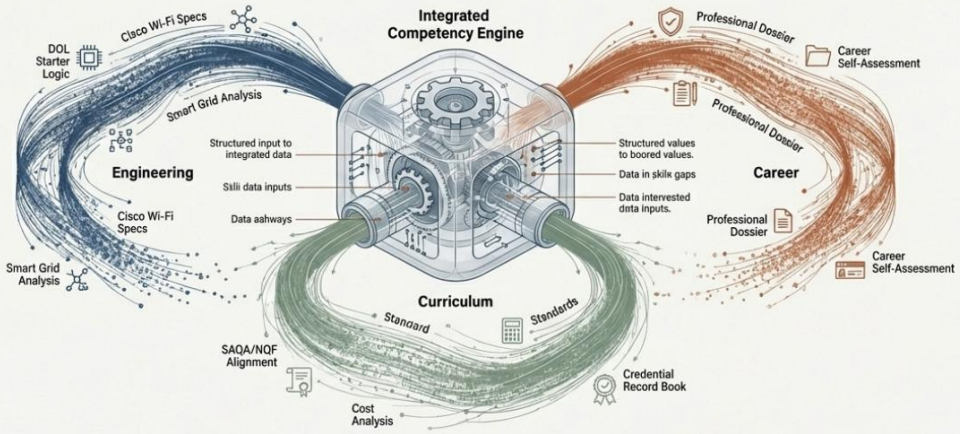
The VBA UserForm Scaffold



This turns self-reflection into structured, actionable data within the career ecosystem.

NotebookLM

One Engine, A Universe of Applications



Whether modeling a high-voltage circuit, mapping a national curriculum, or building a compliant professional portfolio, the underlying logic is the same: structure, auditability, and integration.

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A New Paradigm: Audit-Grade Human Capital

This methodology represents a fundamental shift from static résumés and siloed transcripts to a unified, verifiable, and dynamic record of human potential. It is a system for building **Audit-Grade Human Capital**.

Dynamic & Living

The record is continuously updated with new evidence, projects, and credentials, reflecting lifelong learning.

Verifiable & Trustworthy

Every data point is linked to its source, be it a GitHub commit, a university transcript, or a regulatory filing, creating a high-trust ecosystem.

Integrated & Holistic

It connects formal education, technical skills, compliance status, and on-the-job performance into a single, cohesive narrative of competence.

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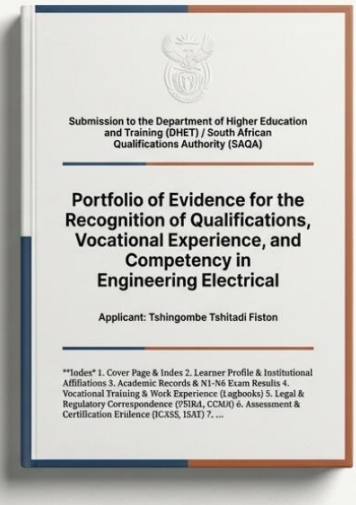
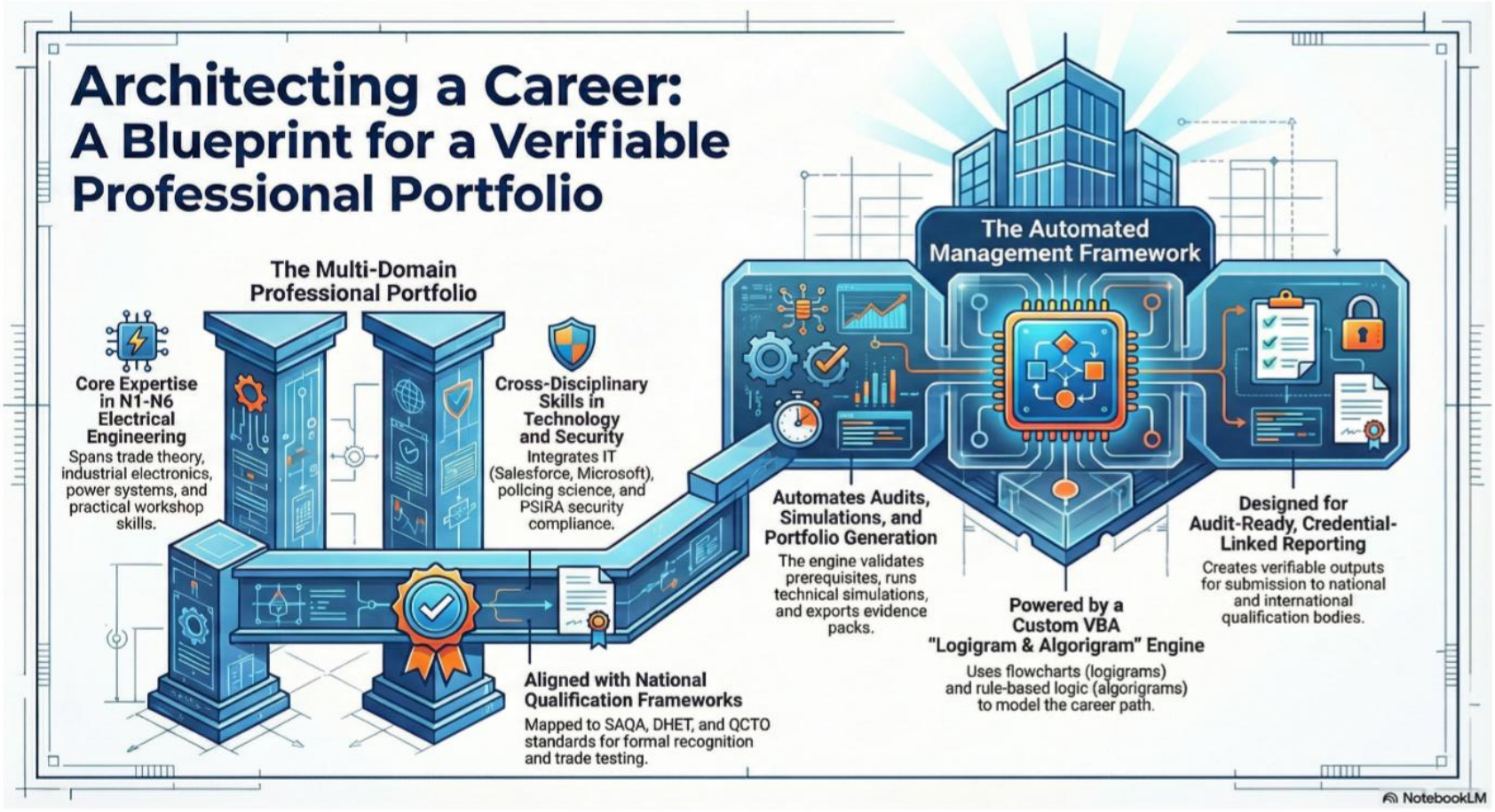
The System Embodied: A Final Portfolio Submission

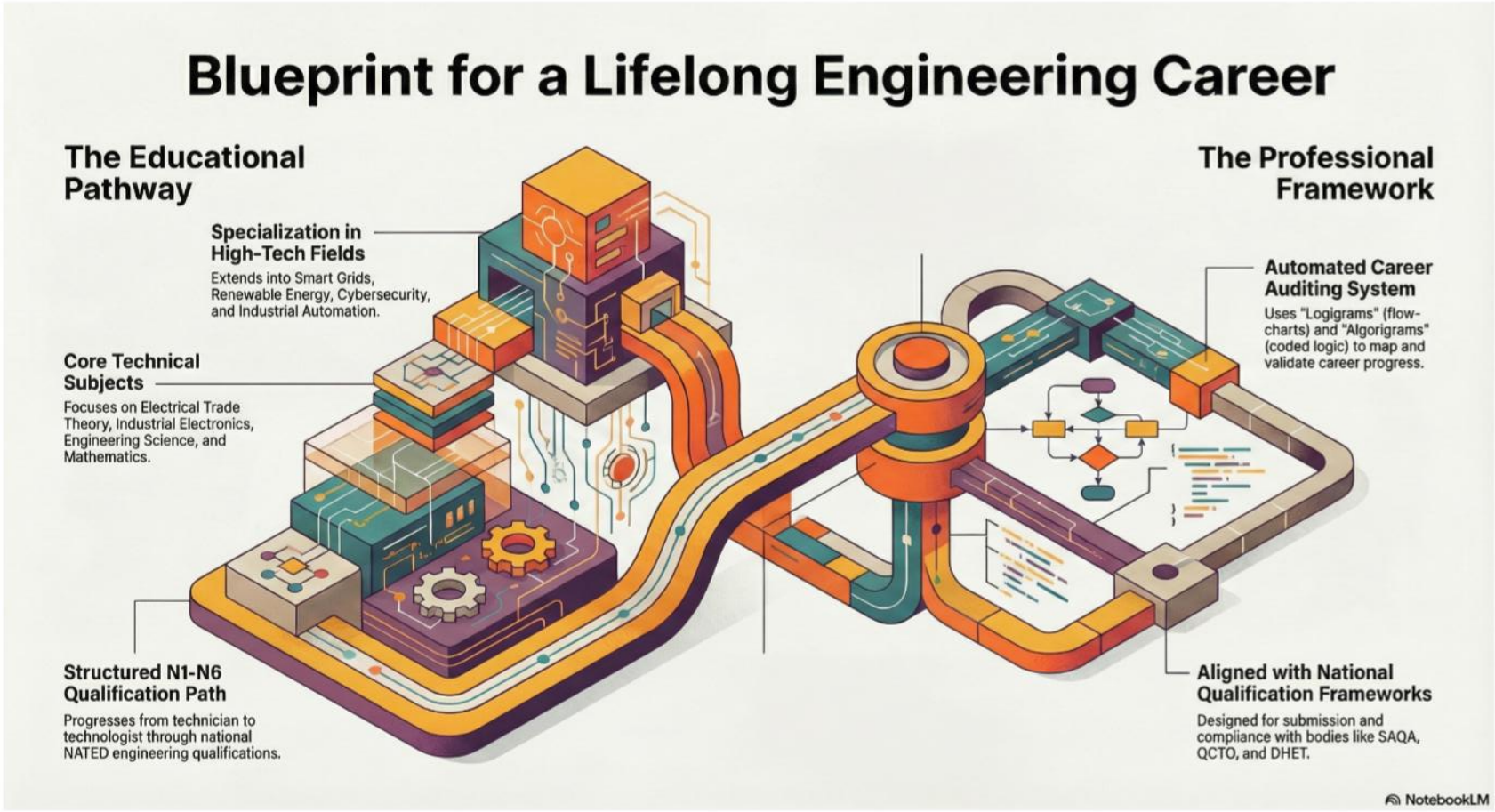

Submission to the Department of Higher Education and Training (DHET) / South African Qualifications Authority (SAQA)
Portfolio of Evidence for the Recognition of Qualifications, Vocational Experience, and Competency in Engineering Electrical
Applicant: Tshingombe Tshitadi Fiston
**Index* 1. Cover Page & Index 2. Learner Profile & Institutional Affiliations 3. Academic Records & N1-N6 Exam Results 4. Vocational Training & Work Experience (Logbooks) 5. Legal & Regulatory Correspondence (PSIRA, CCMA) 6. Assessment & Certification Evidence (ICASS, ISAT) 7. ...

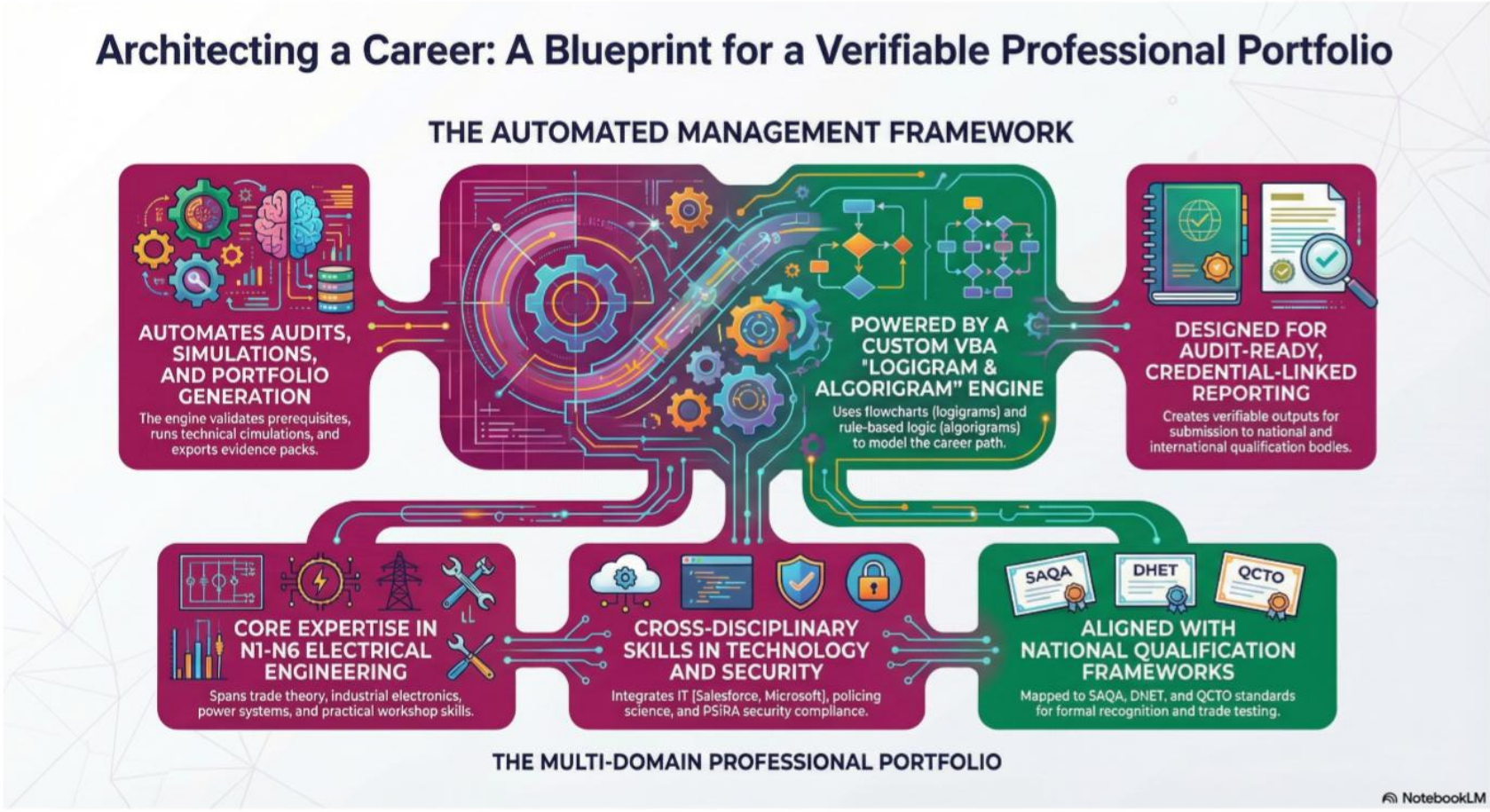
The ultimate output is not a presentation, but a provable record of achievement.

NotebookLM


Architecting a Career:
A Blueprint for a Verifiable Professional Portfolio
The Multi-Domain Professional Portfolio
Core Expertise in N1-N6 Electrical Engineering
Spans trade theory, industrial electronics, power systems, and practical workshop skills.
Cross-Disciplinary Skills in Technology and Security
Integrates IT (Salesforce, Microsoft), policing science, and PSIRA security compliance.
Aligned with National Qualification Frameworks
Mapped to SAQA, DHET, and QCTO standards for formal recognition and trade testing.
The Automated Management Framework
Automates Audits, Simulations, and Portfolio Generation
The engine validates prerequisites, runs technical simulations, and exports evidence packs.
Powered by a Custom VBA "Logigram & Algorigram" Engine
Uses flowcharts (logigrams) and rule-based logic (algorigrams) to model the career path.
Designed for Audit-Ready, Credential-Linked Reporting
Creates verifiable outputs for submission to national and international qualification bodies.
NotebookLM

Blueprint for a Lifelong Engineering Career


The Educational Pathway
Specialization in High-Tech Fields
Extends into Smart Grids, Renewable Energy, Cybersecurity, and Industrial Automation.
Core Technical Subjects
Focuses on Electrical Trade Theory, Industrial Electronics, Engineering Science, and Mathematics.
Structured N1-N6 Qualification Path
Progresses from technician to technologist through national NATED engineering qualifications.
The Professional Framework
Automated Career Auditing System
Uses "Logigrams" (flow-charts) and "Algorigrams" (coded logic) to map and validate career progress.
Aligned with National Qualification Frameworks
Designed for submission and compliance with bodies like SAQA, QCTO, and DHET.
NotebookLM


Architecting a Career: A Blueprint for a Verifiable Professional Portfolio
THE AUTOMATED MANAGEMENT FRAMEWORK
AUTOMATES AUDITS, SIMULATIONS, AND PORTFOLIO GENERATION
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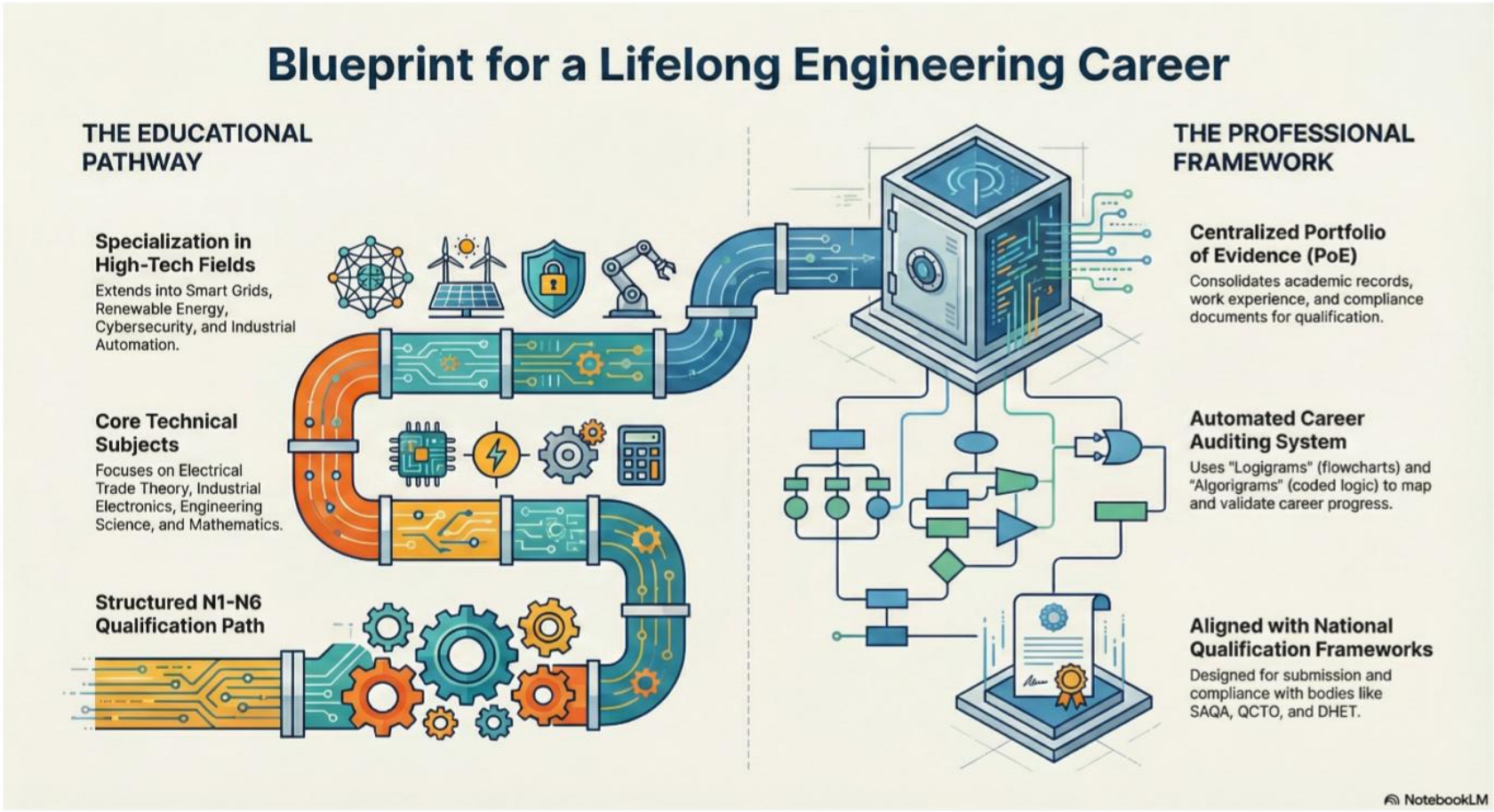
Creates verifiable outputs for submission to national and international qualification bodies.
CORE EXPERTISE IN N1-N6 ELECTRICAL ENGINEERING
Spans trade theory, industrial electronics, power systems, and practical workshop skills.
CROSS-DISCIPLINARY SKILLS IN TECHNOLOGY AND SECURITY
Integrates IT [Salesforce, Microsoft], policing science, and PSiRA security compliance.
SAQA
DHET
QCTO
ALIGNED WITH NATIONAL QUALIFICATION FRAMEWORKS
Mapped to SAQA, DNET, and QCTO standards for formal recognition and trade testing.
THE MULTI-DOMAIN PROFESSIONAL PORTFOLIO
NotebookLM

Blueprint for a Lifelong Engineering Career


THE EDUCATIONAL PATHWAY
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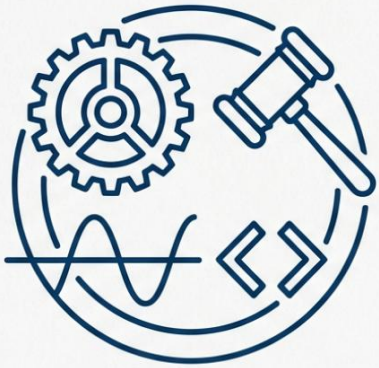
Core Technical Subjects
Focuses on Electrical Trade Theory, Industrial Electronics, Engineering Science, and Mathematics.
Structured N1-N6 Qualification Path
THE PROFESSIONAL FRAMEWORK
Centralized Portfolio of Evidence (PoE)
Consolidates academic records, work experience, and compliance documents for qualification.
Automated Career Auditing System
Uses "Logigrams" (flowcharts) and "Algorigrams" (coded logic) to map and validate career progress.
Aligned with National Qualification Frameworks
Designed for submission and compliance with bodies like SAQA, QCTO, and DHET.
NotebookLM

Engineering Mastery in the 21st Century Is an Integrated System.



Deep technical theory, practical application, regulatory compliance, and systems automation are no longer separate disciplines. They are the four pillars of a single, holistic framework.

NotebookLM

The Conventional View Is a Dangerous Oversimplification.

We have traditionally viewed engineering competency in silos. The theorist in the university, the technician in the field, the compliance officer in the government office, and the programmer at the keyboard. This fragmented approach limits innovation and creates systemic risk.

Theoretical Knowledge

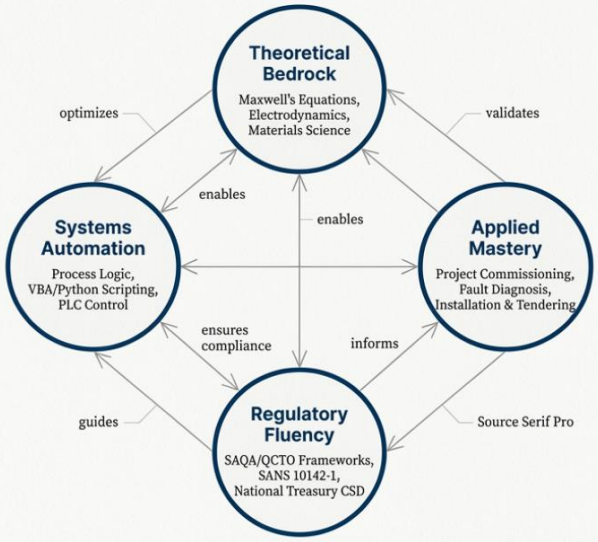
Practical Skills

Regulatory Compliance

Systems & Automation

NotebookLM

A New Blueprint for Professional Competency.



NotebookLM

The Foundation: From First Principles to Granular Calculation

Mastery begins with a deep, mathematical understanding of the physical world. It is the fluency to move seamlessly from foundational laws to the specific calculations that govern component-level design.

Maxwell-Stoke Equations

$$e = NDT/St$$

$$P = 3.v.i \cos j6.(s) \text{ Fresnel}$$

Stator Teeth Induction Calculation

$$Bz = Bzr \,.\, Qp/Az$$

induction in air gap

magnetic flux per pole

cross section of teeth

Result: 2,15T

NotebookLM

Bridging Theory to Practice: From the Lab to the National Grid.

Theoretical knowledge is validated through application. This involves hands-on project work, from system analysis at national utilities to the certified skills required for installation and maintenance.

System Integration Analysis

Circular assessment of student work at City Power & Eskom sites.

High-Voltage Maintenance

Planing and commission of project maintence schema fire detection system...operating tandem fault discrimination electrical.

SAQA Certified Competencies

- ID 10259: Fault find, repair and maintenance of three-phase electrical engineering.
- ID 258937: Install, maintain low voltage, DB protection.
- ID 263006: Demonstrating wiring of premise defining.

NotebookLM

The Automation Layer: Building Intelligence into the System.

Modern engineering is incomplete without automation. The ability to translate physical processes into logical code is essential for creating scalable, efficient, and reliable systems.

Visual Basic Code: PLC & Robotic Control Logic

```
' Relay logic for fault detection
Dim FaultA, FaultB, FaultC As Boolean

Sub ActivateBreaker()
    ' Simulate breaker trip based on fault condition
    BreakerStatus = "Tripped"
End Sub

Private Sub cmdPLCCommand_Click()
    Dim commandCode As String
    commandCode = cboPLCCommand.Text
    Select Case commandCode
        Case "Start"
            MsgBox "PLC: System Start", vbOKOnly
        Case "Stop"
            MsgBox "PLC: Emergency Stop", vbCritical
    End Select
```

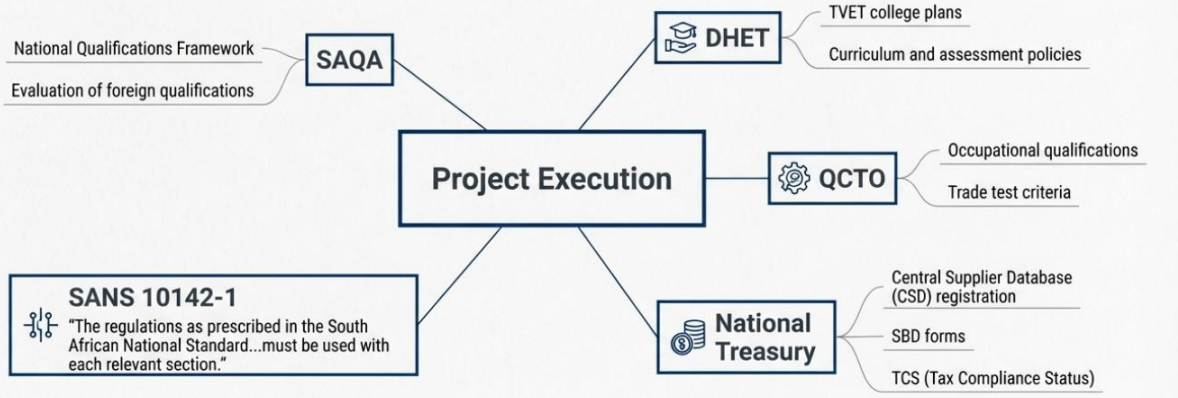
Monitors fault conditions across three phases.

Executes emergency stop command based on PLC input.

NotebookLM

Navigating the Regulatory Architecture

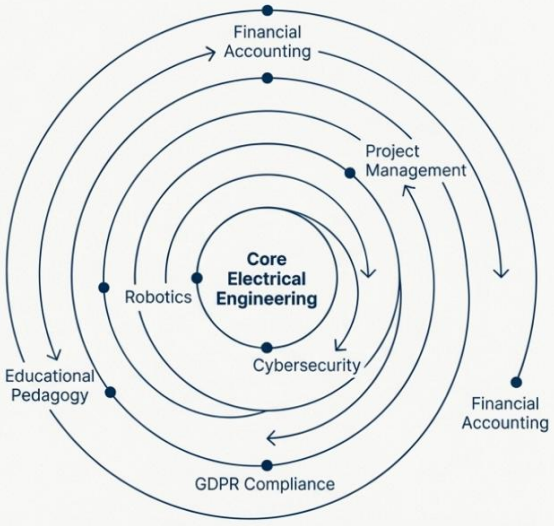
True project viability depends on deep fluency in the national regulatory landscape. This extends beyond technical standards to include qualifications frameworks, public tendering processes, and skills development legislation.



NotebookLM

The Framework in Action: A Case Study in Continuous, Integrated Learning.

A framework is only useful if it can be
A framework is only useful if it can be applied. The following is a real-world test case: a multi-year, self-directed program of acquiring multidisciplinary knowledge, demonstrating a commitment to the principle of continuous, integrated learning.



Over 45 million learners and 10 million graduates demonstrate the platform's success.

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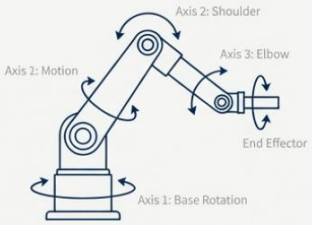
Evidence of a Multidisciplinary Knowledge Base.

Engineering & Tech	Education & Pedagogy	Systems & Management	Compliance & Safety
DIPLOMA IN ROBOTICS	DIPLOMA IN TEACHING SKILLS FOR EDUCATORS	DIPLOMA IN CRITICAL FACILITY MANAGEMENT	GENERAL DATA PROTECTION REGULATION (GDPR)
DIPLOMA IN MECHATRONICS	PHYSICAL EDUCATION – FITNESS TRAINING PRINCIPLES AND METHODS	DIPLOMA IN TRANSPORT MANAGEMENT SYSTEM	OCCUPATIONAL HEALTH & SAFETY ACT
LOW VOLTAGE CIRCUIT BREAKER DESIGNING	INTRODUCTION TO STUDENT DEVELOPMENT	KAIZEN APPROACH – LEAN METHODOLOGY	DIPLOMA IN FIRE SAFETY
AI-POWERED CYBERSECURITY FUNDAMENTALS		DIPLOMA IN PROJECT MANAGEMENT	**Business & Finance**
INTRODUCTION TO 3D PRINTING			DIPLOMA IN ACCOUNTING
DIPLOMA IN SOFTWARE ENGINEERING			BECOMING AN ENTREPRENEUR

NotebookLM

Synthesizing Disparate Domains Through a Common Method

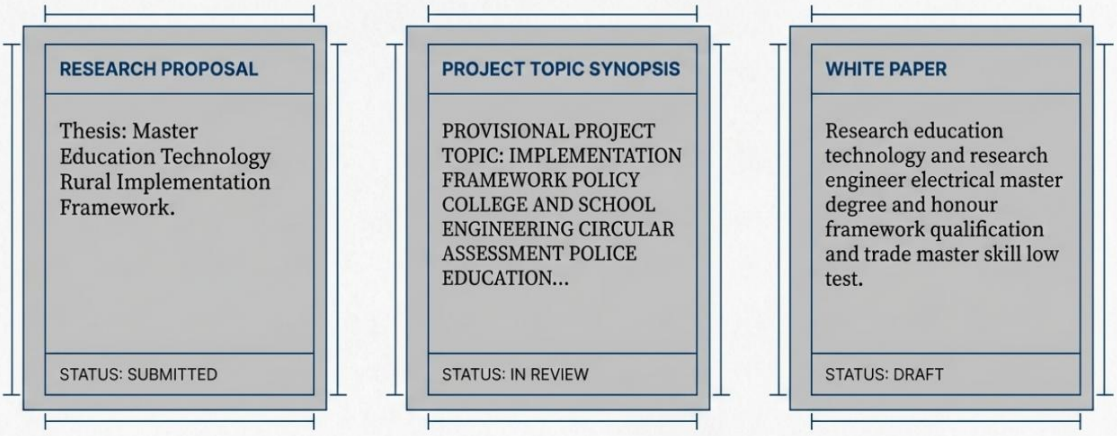
The power of an integrated framework is its universal applicability. The same principles of systems analysis, risk assessment, and process logic used to design a circuit can be applied to understand and improve human and organizational systems.

Mechatronic Systems	Criminal Investigation & Profiling
	
"Signal conditioning in mechatronics... characteristics of operational amplifiers... analogue-to-digital conversion."	"The Theory and Logic Behind Criminal Profiling... psychological struggle between the suspect and the police during interrogation... significance of confession."

NotebookLM

From Personal Framework to Public Contribution

The ultimate goal of this integrated approach is to design and implement robust systems that address critical societal needs, particularly at the intersection of education, technology, and industry.


RESEARCH PROPOSAL
Thesis: Master Education Technology Rural Implementation Framework.
STATUS: SUBMITTED
PROJECT TOPIC SYNOPSIS
PROVISIONAL PROJECT TOPIC: IMPLEMENTATION FRAMEWORK POLICY COLLEGE AND SCHOOL ENGINEERING CIRCULAR ASSESSMENT POLICE EDUCATION...
STATUS: IN REVIEW
WHITE PAPER
Research education technology and research engineer electrical master degree and honour framework qualification and trade master skill low test.
STATUS: DRAFT

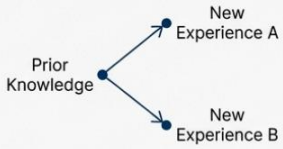
NotebookLM

A Practitioner's Approach to Educational Design

Improving engineering education requires more than just policy; it demands a granular understanding of pedagogy, learning psychology, and curriculum structure, applying constructivist principles to technical training.

Constructivism

"A person learns by mentally organising and reorganising new information or experiences... relating new experiences to prior knowledge." (Citing John Dewey)



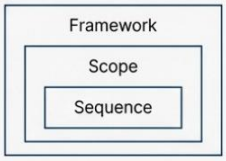
Motivation Theory

"Use the TARGET model... Expectancy x Value = Motivation."

Expectancy x Value = Motivation

Assessment Design

"Curriculum framework... a document that explains how content standards can or should be organized... referred to as the scope and sequence."



NotebookLM

A Global Perspective on Standards and Qualifications

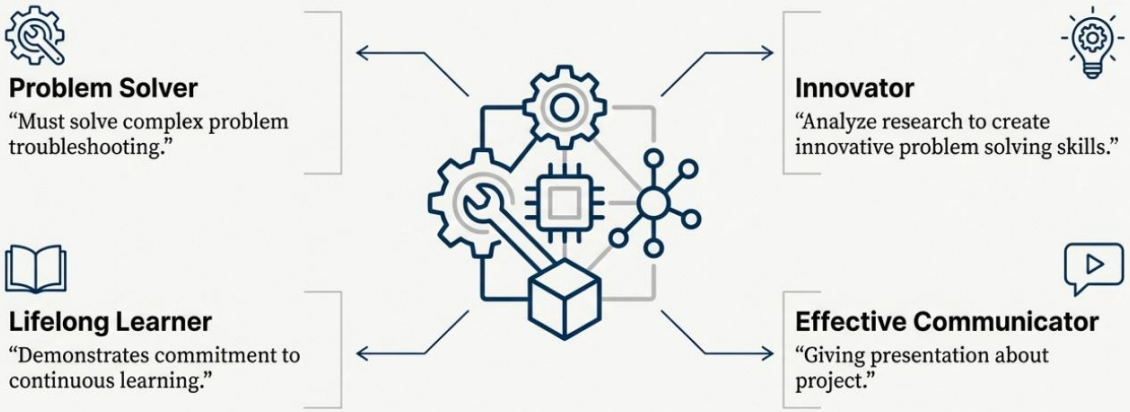
In a globalized world, engineering competency requires alignment with international standards and an understanding of cross-border qualification recognition. This framework is designed with an awareness of bodies like SABS, IEC, and the challenges of foreign credential evaluation.

South Africa: SABS (South African Bureau of Standards), SAQA, "compliance with SANS/ISO 9001, SANS/ISO 27001."
DRC: Mention of "authorised national examination body in the Democratic Republic of Congo" from SAQA correspondence.

NotebookLM

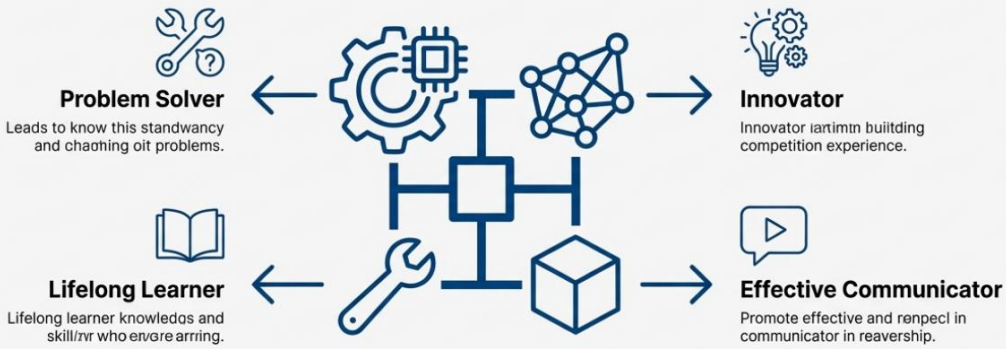
The 21st-Century Engineer is a Systems Integrator.

The professional of the future is not defined by a single skill, but by their ability to synthesize knowledge across domains. They are a researcher, a builder, a compliance expert, and an automator. They think in systems and build integrated solutions.



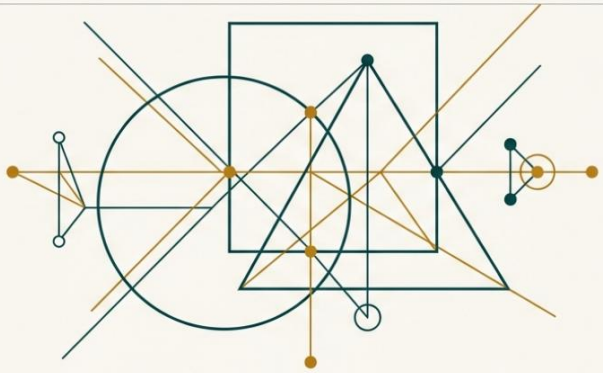
NotebookLM

The Framework Is the Future


Problem Solver
Leads to know this standwancy and chaoning oit problems.
Innovator
Innovator iartimin buiitding competition experience.
Lifelong Learner
Lifelong learner knowledas and skill/rvr who ervare arrring.
Effective Communicator
Promote effective and renpecl in communicator in reavership.

This is not just a personal methodology; it is a replicable blueprint for developing the versatile, resilient, and deeply competent technical leaders required to solve the complex challenges of tomorrow.

NotebookLM



The Profile of a Polymath Engineer

A Case Study in the Synthesis of Foundational Expertise, Cross-Disciplinary Fluency, and Innate Systems Design

Tshingombe Fiston

Portfolio of Evidence | 2025

NotebookLM

A Foundation in Electrical Engineering: Verifiable Qualifications

Core competency begins with a robust, certified understanding of electrical engineering principles, demonstrated through a comprehensive set of national qualifications.

Evidence Panel 1

National Certificate Engineering Studies (N1-N6)
Institution: St Peace College

- Electrical Trade Theory
- Industrial Electronics
- Electrotechnics
- Mathematics
- Engineering Science
- Engineering Drawing

N1: SAQA **ID 6710**
N2: SAQA **ID 637375**
N3: SAQA **ID 67491**

Evidence Panel 2

Specialized SAQA-Registered Skills

ID 10259: Fault find, repair and maintenance of three-phase electrical systems.

ID 263006: Demonstrating an understanding of wiring of premises.

ID 258937: Install and maintain low voltage distribution boards, protection and earthing.

ID 116466: Inspection and testing of electrical circuits.

NotebookLM

Engineering in Practice: From First Principles to Complex Calculations

Theoretical knowledge is translated into practical application through a deep engagement with the **fundamental** formulas and complex calculations that govern electrical systems.

Power & Circuit Theory

Power factor:
`P = u.i = p + jq`

Impedance & Resistance:
`1/z = 1/r`
`1/g` conductance

Series/Parallel Logic:
`R1+R2+R3...`
`1/R1+1/R2+1/R3...`

Transformers & Machines

EMF Equation:
`E = NDT/St` (Kapp hypothesis)

Voltage Regulation:
`V1 < E1…`
`E2 = I2.Ro.xos2+I2Xo2.sin&2+v2`

Three-Phase Connections:
`"Connecting start delta zig zag…`
`Y..VP=Vl÷√3… D. VP=vl"`

Induction & Magnetic Flux

Calculation snippet:
`"Calculation of induction in teeth of stator, Bz=Bzr, Qp/Az"`

Formula example:
`q'v=Qu.fu/du=93,4×0,34/62= 0,512mm`

NotebookLM

Expanding the Core: A Deliberate Pursuit of Cross-Disciplinary Fluency

Building on a strong **engineering foundation**, a **rigorous self-directed curriculum** was undertaken to achieve fluency in the technologies shaping the future of industry and systems.

Competency Cluster: Intelligent & Automated Systems

Robotics

- Diploma in Robotics

Cognitive Robotics

- Diploma in the Foundations of Cognitive Robotics

Mechatronics

- Diploma in Mechatronics
- An Introduction to Mechatronic Systems
- Signal Conditioning in Mechatronics

Artificial Intelligence

- AI-Powered Cybersecurity Fundamentals
- Psychological Theories of Intelligence

NotebookLM

Building the Full Stack: From Microcontrollers to Secure Applications

A comprehensive understanding of modern systems requires knowledge at every layer of the technology stack, from physical circuits to software architecture and digital security protocols.

Competency Cluster: Electronics, Software & Security

Circuit Design
Understand Electronic & Microcontroller Circuit Design and Simulation
Low Voltage Circuit Breaker Designing

Software Engineering
How to Become a Software Engineer

Cybersecurity & Data Protection
Physical Security Fundamentals
General Data Protection Regulation (GDPR)

3D Printing
Introduction to 3D Printing

"Hard skills are technical skills that are learned through education, training, or hands-on experience. They can be measured for proficiency and competency."

NotebookLM

A Focus on Pedagogy: Understanding How Knowledge is Structured and Transferred

Beyond technical application, there is a deep exploration of educational theory, instructional design, and the psychology of learning—key components for developing effective training and knowledge systems.

Formal Qualification

- Diploma in Teaching Skills For Educators (Alison)

Key Concepts Studied

- **Constructivism**: "'A person learns by mentally organising and reorganising new information or experiences." (Citing John Dewey)
- **Behaviourism**: "Operant conditioning focuses on how the consequences of behaviour affect the behaviour over time." (Citing Skinner)
- **Motivation Theory**: "Expectancy x Value = Motivation'" in Source Code Pro for the formula
- **Instructional Design:** "Curriculum Framework: a document that explains how content standards can or should be organized for a particular subject."
- **Taxonomies of Learning**: "Cognition (thoughts), Affect (emotions), Psychomotor (physical skills)."

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Application in the Professional Sphere: Management, Safety, and Industry

The synthesis of technical and educational knowledge finds its application in the structured environments of industrial operations, safety protocols, and project management.

Competency Cluster: Industrial & Managerial Skills

Safety & Operations

- Diploma in Rigging and Lifting
- Fire Safety
- Machinery Safety
- Occupational Health & Safety Act

Process & Logistics

- Kaizen Approach - Lean Methodology for Continuous Improvement
- Transport Management System (TMS)

Business & Energy

- Understanding Accounting and Financial Statements
- Diploma in Petroleum Engineering
- Introduction to Solar Energy Engineering

NotebookLM

The Synthesizing Mind: A Drive to Architect Systems and Automate Process

The defining characteristic of this profile is not just the acquisition of disparate skills, but an inherent compulsion to connect them through the **design** of frameworks, procedural logic (**Algorigrammes**), and **flow diagrams** (**Logigrammes**).

Primary Evidence: Development in Visual Basic for Applications (VBA)

This systems-thinking approach is most evident in the development of custom VBA modules designed to manage complex, data-driven processes.

```
' === KfrmRobot: Robotic Control Interface ===
Private Sub cmdMove_Click()
    Dim xPos As Double, yPos As Double, zPos As Double
    xPos = val(txtX.Text)
    ...
    Call ActivateServo(xPos, yPos, zPos)
End Sub
```

```
' VBA Module: Credential Lifecycle & Audit Dashboard
Sub GenerateCredentialDashboard()
    Dim ws As Worksheet
    Set ws = ThisWorkbook.Sheets("CredentialDashboard")
    ...
End Sub
```

NotebookLM

Case Study in Systems Design: Architecting a Credential Management Framework

A practical example of process architecture: designing a system to manage the lifecycle of professional credentials, from application and validation to audit and export.

Exhibit A: The Logigramme (Logical Flow)

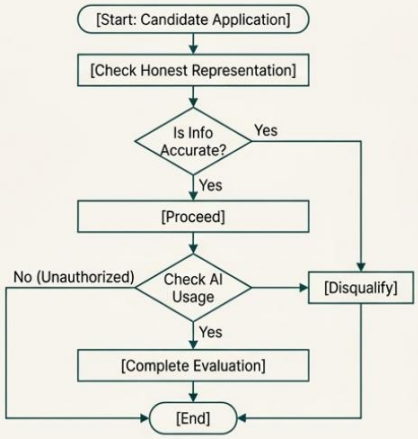

Exhibit B: The Algorigramme (Procedural Logic)

```
' Function to determine application status
Function IsApplicationOpen(closingDate As Date) As
Boolean

    If Date <= closingDate Then
        IsApplicationOpen = True
    Else
        IsApplicationOpen = False
    End If
End Function

' Function to determine credential status
Function DetermineCredentialStatus(issueDate As Date,
expiryDate As Date) As String
    If Date > expiryDate Then
        DetermineCredentialStatus = "Expired"
        ...
    Else
        DetermineCredentialStatus = "Active"
    End If
End Function
```

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Granular Logic: Deconstructing Problems into Custom Equations

The systems approach extends to the micro level, where complex interactions are distilled into bespoke logical equations and control models.

DB Box System Logic
Source Serif Pro

```
Db =
F1.+MCB+kvar+
kwh
```

Db = lights+ outlet socket+guyzer+
Inter

Key Lock Comparable Logic
Source Serif Pro

```
K1.1 x
+k.2.1+kn ..=
k implentation
```

Source Code Pro

DOL Motor Control
Source Serif Pro

```
Km1=
F1+so+(S1+km1).
Motor
```

Source Code Pro

NotebookLM

Convergence of Disciplines: Research and Implementation Frameworks

The synthesis of engineering, technology, and education culminates in a focused research interest: the design and implementation of frameworks to solve complex socio-technical challenges.

Exhibit A: NRF Grant Application Details

Application Ref: PSTD250411310291
Scientific Domain: Engineering
Secondary Research Fields: Electrical Engineering, Education, Information and library science

Exhibit B: Proposed Research Titles

- "master education technology rural implentation framework"
- "Research education technology and research engineer electrical master degree and honour framework qualification and trade master skill"
- "Thesis: Research policy trade theory minimum : legislation skill development"

Source Repository:
`https://github.com/Kananga5/Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules`

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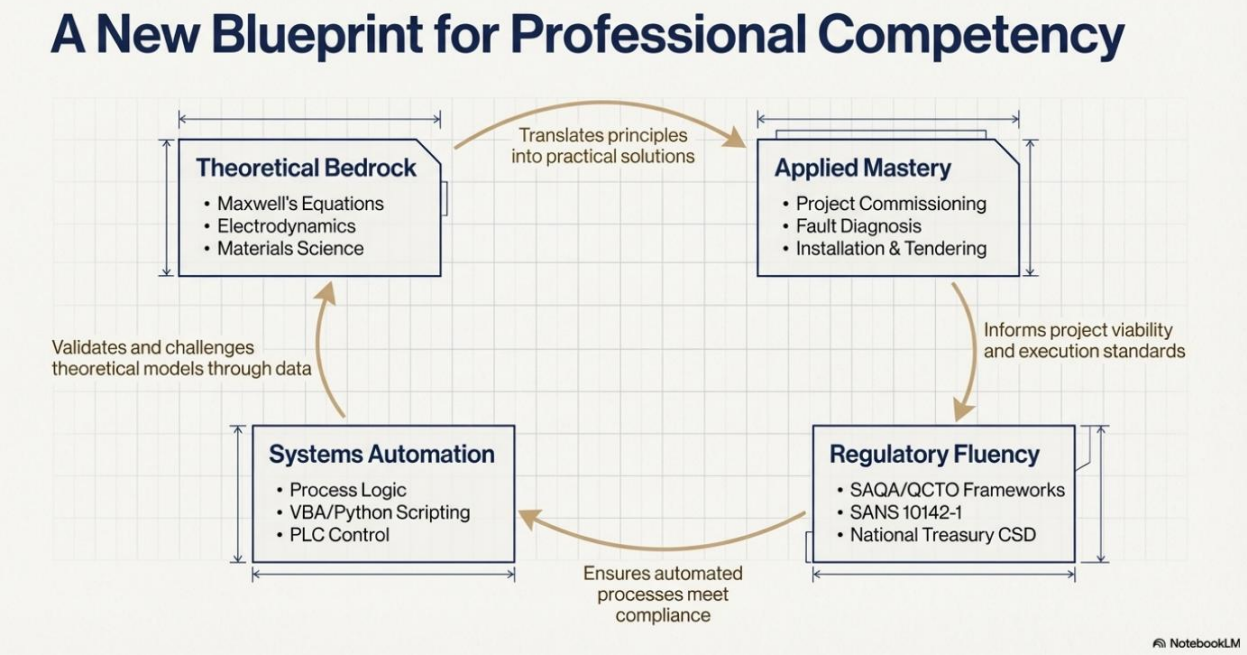
The Conventional View Is a Dangerous Oversimplification
We have traditionally viewed engineering competency in silos. The theorist in the university, the technician in the field, the compliance officer in the government office, and the programmer at the keyboard. This fragmented approach limits innovation and creates systemic risk.
FRAGMENTED APPROACH LIMITS INNOVATION
CREATES SYSTEMIC RISK
Theoretical Knowledge
Practical Skills
Regulatory Compliance
Systems & Automation
NotebookLM


A New Blueprint for Professional Competency
Theoretical Bedrock
• Maxwell's Equations
• Electrodynamics
• Materials Science
Translates principles into practical solutions
Applied Mastery
• Project Commissioning
• Fault Diagnosis
• Installation & Tendering
Informs project viability and execution standards
Regulatory Fluency
• SAQA/QCTO Frameworks
• SANS 10142-1
• National Treasury CSD
Ensures automated processes meet compliance
Systems Automation
• Process Logic
• VBA/Python Scripting
• PLC Control
Validates and challenges theoretical models through data
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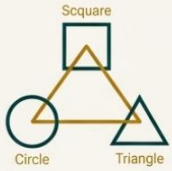

A New Professional Archetype: The Polymath Engineer

1. Deep Foundational Expertise

Anchored in verifiable qualifications and a practical command of Electrical Engineering, from first principles to advanced applications.

2. Broad Cross-Disciplinary Fluency

Demonstrated through a self-directed and strategic acquisition of skills across intelligent systems, software, security, pedagogy, and industrial management.

3. Innate Systems Architecture

Distinguished by a unique, inherent drive to design and automate processes, evidenced by the creation of custom frameworks, logical models (Logigrammes), and coded implementations (Algorigrammes).

This is not a portfolio of disparate credentials, but a case study in the deliberate construction of a professional capable of synthesizing knowledge to architect solutions for complex, multi-domain challenges.

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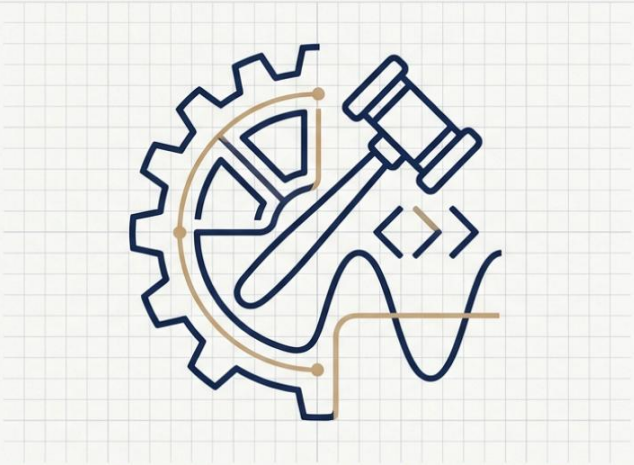

Engineering Mastery in the 21st Century Is an Integrated System.

Deep technical theory, practical application, regulatory compliance, and systems automation are no longer separate disciplines. They are the four pillars of a single, holistic framework.

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The Foundation: From First Principles to Granular Calculation.

Mastery begins with a deep, mathematical understanding of the physical world. It is the fluency to move seamlessly from foundational laws to the specific calculations that govern component-level design.

Maxwell-Stoke Equations

$$e = N\frac{d\Phi}{dt}$$

$$P = 3 \cdot v \cdot i\cos(\varphi)$$

Stator Teeth Induction Calculation

A_p: pole surface area

$$B_z = B_{zr} \cdot \frac{A_p}{A_z} = 2{,}15\ \mathrm{T}$$

B_{zr}: induction in air gap A_z: tooth cross-section area

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Bridging Theory to Practice: From the Lab to the National Grid.

Theoretical knowledge is validated through application. This involves hands-on project work, from system analysis at national utilities to the certified skills required for installation and maintenance.

System Integration Analysis

Circular assessment of student work at City Power & Eskom sites.

High-Voltage Maintenance

Planing and commission of project maintence schema fire detection system....operating tandem fault discrimination electrical.

Certified Competencies (SAQA Unit Standards)

ID 10259	Fault find, repair and maintenance of three-phase electrical engineering.
ID 258937	Install, maintain low voltage, DB protection.
ID 263006	Demonstrating wiring of premise defining.

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The Automation Layer: Building Intelligence into the System.

Modern engineering is incomplete without automation. The ability to translate physical processes into logical code is essential for creating scalable, efficient, and reliable systems.

Visual Basic Code: PLC & Robotic Control Logic

```
' Relay logic for fault detection
Dim FaultA, FaultB, FaultC As Boolean

Sub ActivateBreaker()
    ' Simulate breaker trip based on fault condition
    BreakerStatus = "Tripped"
End Sub

Private Sub cmdPLCCommand_Click()
    Dim commandCode As String
    commandCode = cboPLCCommand.Text
    Select Case commandCode
        Case "Start"
            MsgBox "PLC: System Start", vbOKOnly
        Case "Stop"
            MsgBox "PLC: Emergency Stop", vbCritical
    End Select
End Sub
```

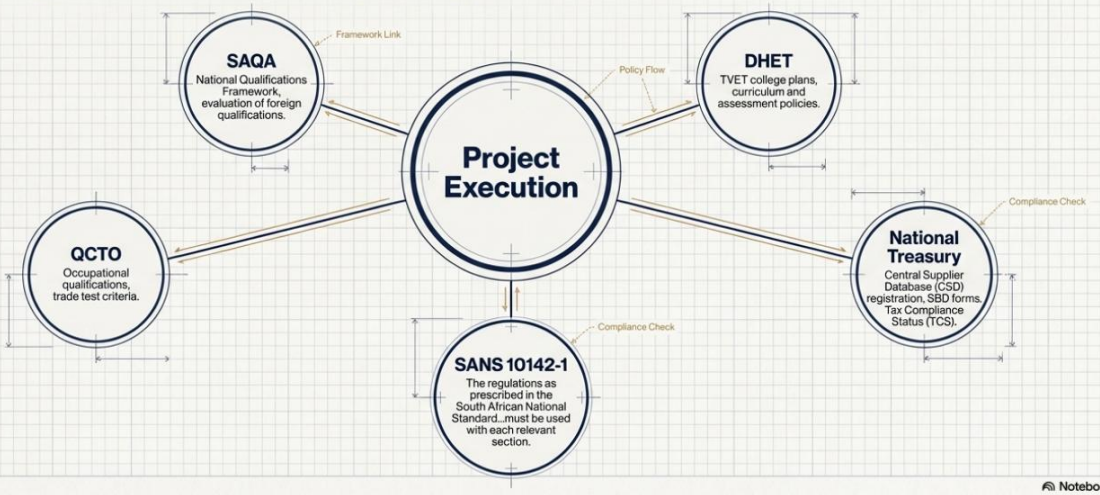
Monitors fault conditions on three phases.

Executes emergency stop command for system safety.

NotebookLM

Navigating the Regulatory Architecture

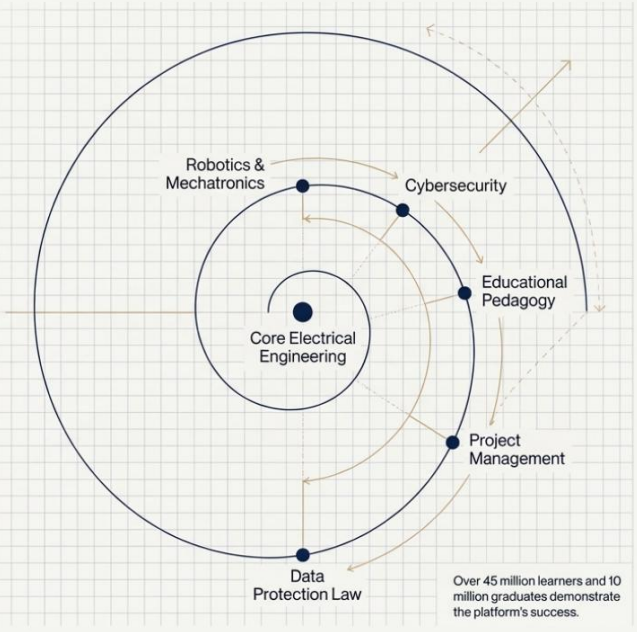
True project viability depends on deep fluency in the national regulatory landscape. This extends beyond technical standards to include qualifications frameworks, public tendering processes, and skills development legislation.


SAQA
National Qualifications Framework, evaluation of foreign qualifications.
Framework Link
DHET
TVET college plans, curriculum and assessment policies.
Policy Flow
Project Execution
QCTO
Occupational qualifications, trade test criteria.
National Treasury
Central Supplier Database (CSD) registration, SBD forms, Tax Compliance Status (TCS).
Compliance Check
SANS 10142-1
The regulations as prescribed in the South African National Standard...must be used with each relevant section.
Compliance Check

NotebookLM

The Framework in Action: A Case Study in Continuous, Integrated Learning.

A framework is only useful if it can be applied. The following is a real-world test case: a multi-year, self-directed program of acquiring multidisciplinary knowledge, demonstrating a commitment to the principle of continuous, integrated learning.



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Evidence of a Multidisciplinary Knowledge Base.

Engineering & Tech	Education & Pedagogy	Systems & Management	Compliance & Safety	Business & Finance
Diploma in Robotics	Diploma in Teaching Skills For Educators	Diploma in Critical Facility Management	General Data Protection Regulation (GDPR)	Diploma in Accounting
Diploma in Mechatronics	Introduction to Student Development	Diploma in Transport Management System	Occupational Health & Safety Act	Becoming an Entrepreneur
Low Voltage Circuit Breaker Designing	Physical Education - Fitness Training	Kaizen Approach - Lean Methodology	Diploma in Fire Safety	Basics of Criminal Investigation
AI-Powered Cybersecurity Fundamentals	Multi-Cultural and Anti-Bias Education	Diploma in Project Management	Basics of Machine Safeguarding	The Theory and Logic Behind Criminal Profiling
Introduction to 3D Printing		Security Operations Center (SOC) Fundamentals		
Diploma in Software Engineering				
Signal Conditioning in Mechatronics				

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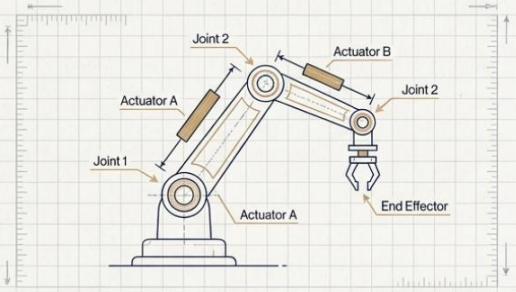
Synthesizing Disparate Domains Through a Common Method.

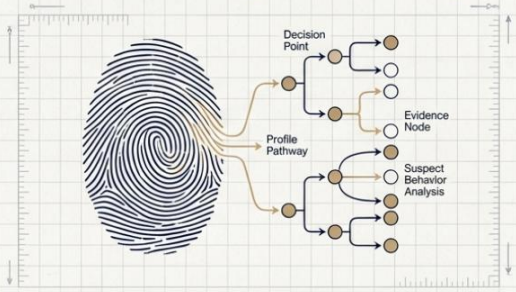
The power of an integrated framework is its universal applicability. The same principles of systems analysis, risk assessment, and process logic used to design a circuit can be applied to understand and improve human and organizational systems.

Mechatronic Systems



Signal conditioning in mechatronics... characteristics of operational amplifiers... analogue-to-digital conversion.

Criminal Investigation & Profiling



The Theory and Logic Behind Criminal Profiling... psychological struggle between the suspect and the police during interrogation... significance of confession.

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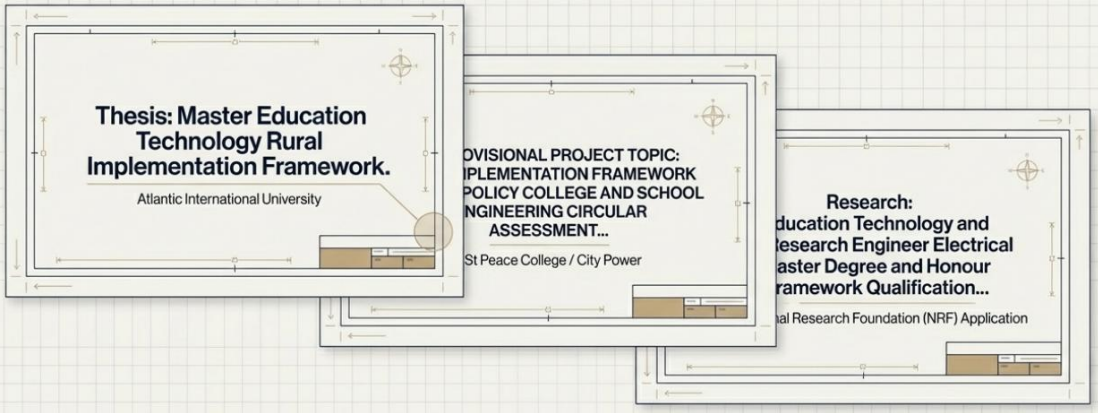
From Personal Framework to Public Contribution.

The ultimate goal of this integrated approach is to design and implement robust systems that address critical societal needs, particularly at the intersection of education, technology, and industry.



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A Practitioner's Approach to Educational Design

Improving engineering education requires more than just policy; it demands a granular understanding of pedagogy, learning psychology, and curriculum structure, applying constructivist principles to technical training.

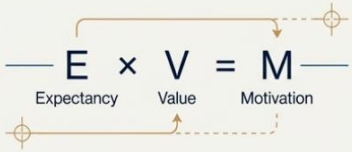
Constructivism

"A person learns by mentally organising and reorganising new information or experiences... relating new experiences to prior knowledge."

(Citing John Dewey)

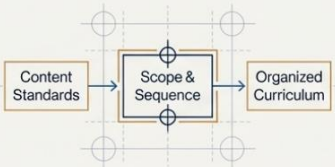
Motivation Theory

"Use the TARGET model... Expectancy x Value = Motivation."



Assessment Design

"Curriculum framework... a document that explains how content standards can or should be organized... referred to as the scope and sequence."



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A Global Perspective on Standards and Qualifications

In a globalized world, engineering competency requires alignment with international standards and an understanding of cross-border qualification recognition. This framework is designed with an awareness of bodies like SABS, IEC, and the challenges of foreign credential evaluation.

Europe: EU directives (e.g., LVD, EMC, RED), IEC (International Electrotechnical Commission).
South Africa: SABS (South African Bureau of Standards), SAQA, compliance with SANS/ISO 9001, SANS/ISO 27001.
DRC: Evaluation of qualifications from the "authorised national examination body in the Democratic Republic of Congo."

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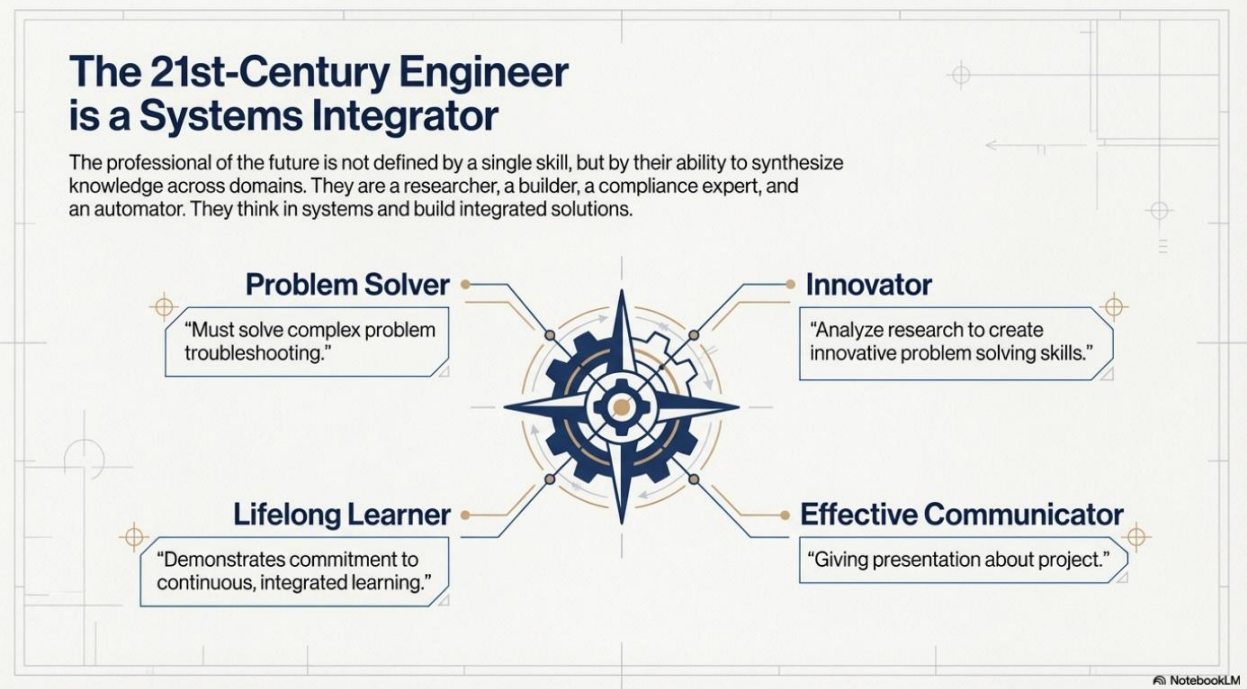
The 21st-Century Engineer is a Systems Integrator
The professional of the future is not defined by a single skill, but by their ability to synthesize knowledge across domains. They are a researcher, a builder, a compliance expert, and an automator. They think in systems and build integrated solutions.
Problem Solver
"Must solve complex problem troubleshooting."
Innovator
"Analyze research to create innovative problem solving skills."
Lifelong Learner
"Demonstrates commitment to continuous, integrated learning."
Effective Communicator
"Giving presentation about project."
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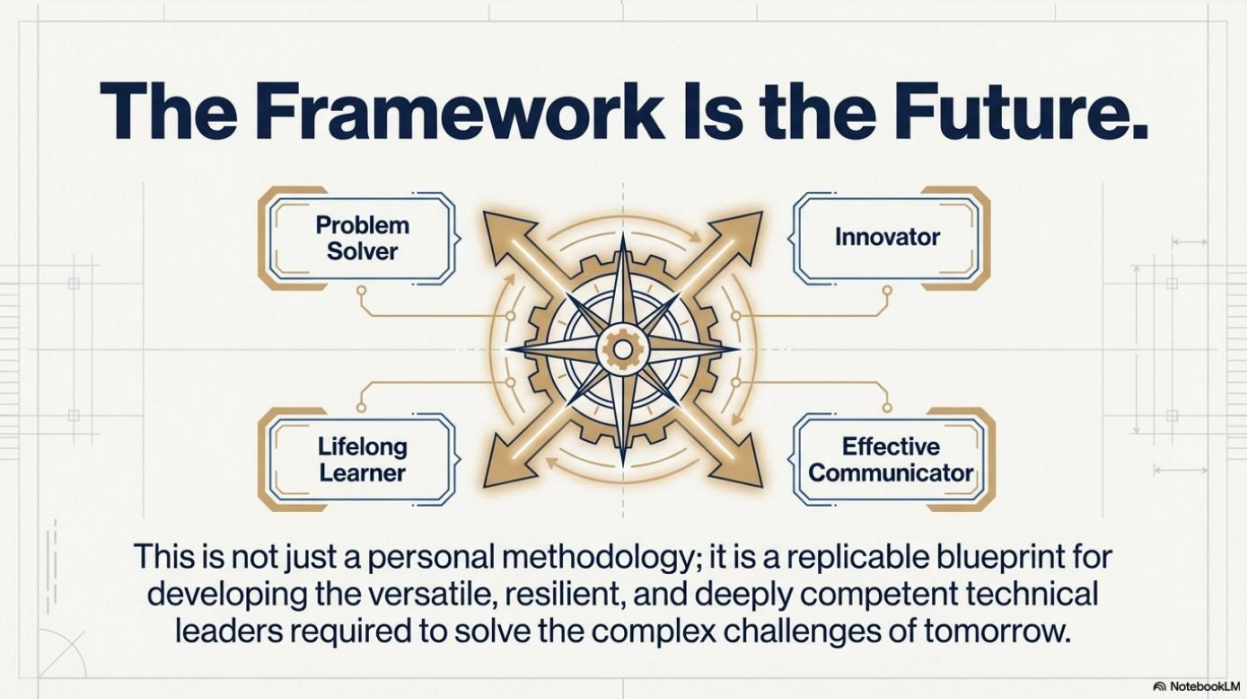
The Framework Is the Future.
Problem Solver
Innovator
Lifelong Learner
Effective Communicator
This is not just a personal methodology; it is a replicable blueprint for developing the versatile, resilient, and deeply competent technical leaders required to solve the complex challenges of tomorrow.
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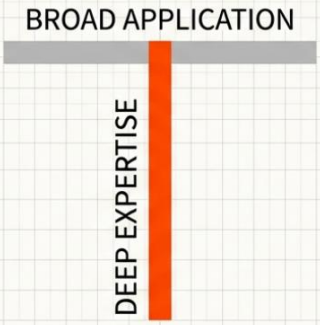
An Integrated Engineering Professional

Bridging Deep Technical Mastery with Cross-Disciplinary Expertise



Tshingombe Tshitadi Fiston

NotebookLM

A Multi-Domain Expert Who Synthesizes Theory, Practice, and Systems Thinking

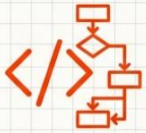
Mr. Tshingombe offers a rare combination of deep electrical engineering knowledge and a broad platform of skills in research, software development, regulatory compliance, and pedagogy. This unique blend allows him to not only execute complex technical tasks but also to design systems, automate processes, and transfer knowledge effectively, bridging the gap between concept and real-world implementation.

Core Engineering Mastery

Foundational expertise in electrotechnics, power systems, and industrial electronics from N1 to N6 levels.

Research & Innovation

Exploration of nanostructured materials and educational technology frameworks, with engagement at the National Research Foundation (NRF) level.



Systems & Software Integration

Practical application of VBA, Git, and logical frameworks (`Logigramme`, `Algorigramme`) to automate and manage complex workflows.

Compliance & Governance

Thorough understanding and application of key standards including SANS 10142-1, the OHS Act, and government procurement protocols (CSD).

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The Vertical Pillar: Deep Expertise in Electrical Engineering

Source Sans Pro Regular

A detailed exploration of the theoretical foundations, practical applications, and specialized knowledge that form the bedrock of his professional practice.

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Grounded in the Foundational Principles of Electrical Science

Power & Circuit Analysis

Demonstrating a deep understanding of AC/DC theory, impedance, and power calculations.

$$P = 3 \cdot v \cdot i \cos \phi$$

(Three-Phase Power)

$$\frac{1}{Z} = \frac{1}{R} + \frac{1}{G} + \frac{1}{L} + \frac{1}{C}$$

(Parallel Circuit Admittance)

$$E_r = I_s \cdot (R_a + jx_s)$$

(Resultant Voltage in Synchronous Motor)

Electromagnetism & Machines

Citing the core laws governing motors and transformers.

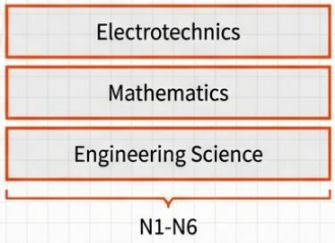
Lenz's Law, Maxwell's Equations, Kapp's Hypothesis.

$$E_b = k_a \cdot \Phi_a \cdot N_s$$

(Back EMF in Motor)

Academic Foundation

Underpinned by comprehensive N1-N6 Engineering Studies covering Electrotechnics, Mathematics, and Engineering Science.



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Proven Capabilities in Practical Installation, Maintenance, and Fault Finding.

- **Installation & Wiring:** Demonstrating proficiency in wiring premises, installing and maintaining low-voltage distribution boards and protection systems. [SAQA ID: 263006] [SAQA ID: 258937]

- **Maintenance & Repair:** Experienced in fault finding, testing and repair of electric motors, and maintenance of control panels and circuits. [SAQA ID: 10259]

- **System Implementation:** Competent in planning and commissioning projects such as fire detection systems, CCTV, and home automation systems.

- **Component-Level Work:** Skilled in conductor joining, crimping, soldering, and assembly of panels and components.

- **Testing & Inspection:** Executing continuity tests, earth conductor resistance tests, and compliance checks for single and three-phase installations.

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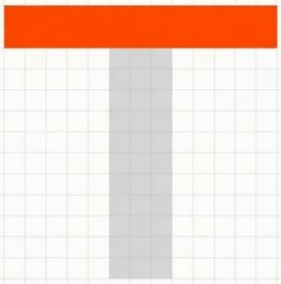


The Horizontal Platform: Amplifying Expertise Across Disciplines

An overview of capabilities in research, software, compliance, and pedagogy that extend and enhance his core engineering expertise.

NotebookLM

A Commitment to Research, Innovation, and Lifelong Learning.

Formal Research Engagement

Actively pursuing grants and engaging with the National Research Foundation (NRF), including a Postdoctoral Grant application.

Reference: PSTD250411310291

Fields of Specialization

Research interests span advanced and emerging fields, including:

- Nanostructured Materials and Packaging
- Additive Manufacturing
- Materials Science and Engineering

Authored Research

Produced academic work focused on the practical application of technology in education, such as the thesis titled:

Master Education Technology Rural Implementation Framework.

Continuous Professional Development

Holds numerous diplomas and certificates from Alison, demonstrating a proactive approach to skill acquisition in fields like Robotics, Mechatronics, and Solar Energy Engineering.

NotebookLM

Engineering Systematic Solutions with Code and Logic

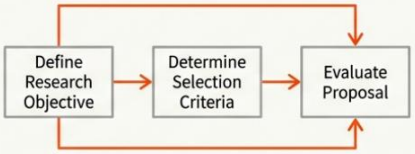
VBA for Process Automation

Developed custom VBA modules for diverse applications, including:

- **'Credential Lifecycle Management'**: Automating the tracking, validation, and auditing of professional qualifications.
- **'Robotic Control Interface'**: Creating UserForms to control robotic movements (`ActivateServo`).
- **'PLC Logic Simulation'**: Modeling industrial control commands (`Start`, `Emergency Stop`, `Reset`).

```
' === KfrmRobot: Robotic Control Interface ===
Private Sub cmdMove_Click()
    Dim xPos As Double, yPos As Double, zPos As Double
    xPos = val(txtX.Text)
    yPos = val(txtY.Text)
    zPos = val(txtZ.Text)
    lblStatus.Caption = "Moving to X:" & xPos & " Y:" & yPos & " Z:" & zPos
    Call ActivateServo(xPos, yPos, zPos)
End Sub
```

Systems Thinking Frameworks



Utilizes `Logigramme` (Logical Flow Diagrams) and `Algorigramme` (Algorithmic Flow) to design and document complex decision-making processes before implementation.

Version Control Proficiency

Manages and shares code through Git, with public repositories on GitHub: github.com/Kananga5/Curriculum-section-1-1.1-Thesis...

NotebookLM

Operating within a Framework of Rigorous Compliance and Governance.

Technical & Safety Standards

SANS 10142-1: Adherence to the South African National Standard for the wiring of premises.

Occupational Health & Safety (OHS) Act 85 of 1993: Application of legal requirements for workplace safety.

International & Military Standards: Familiarity with IEC (International Electrotechnical Commission) and MIL-STD specifications for marking, components, and data plates.

Government & Public Sector Protocols

National Treasury Central Supplier Database (CSD): Experience navigating government systems, including CSD registration and management.

SARS e-Filing: Proficiency with the South African Revenue Service e-Filing system for tax compliance.

Public Tendering Processes: Experience in responding to Requests for Quotation (RFQ) and formal tender processes.

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An Educator and Mentor Capable of Building Technical Competence.

Experience & Approach

Lecturer & Facilitator: Served as an educator at St Peace College, responsible for delivering technical curriculum and managing student assessments.

Curriculum Development: Designed and documented learning materials, including the N2 Electrical Trade Theory Lecturer Guide, which details weekly lesson plans, facilitation methods, and student activities.

Grounded in Educational Theory

Constructivism: Focus on learners mentally organizing new information by relating it to prior knowledge (citing John Dewey).

Operant Conditioning: Understanding how consequences and reinforcement affect behavior and skill acquisition.

Student Development: Differentiating between learning and long-term development to tailor teaching strategies effectively.

In Practice: N2 Lecturer Guide Snippet

Week	Topic	Content	Hours
4	Module 4 Switchgear and protective devices	4.1 Switchgear, 4.2 Switchgear – isolating, 4.3 Switchgear – control, 4.4 Protective devices	10 hours

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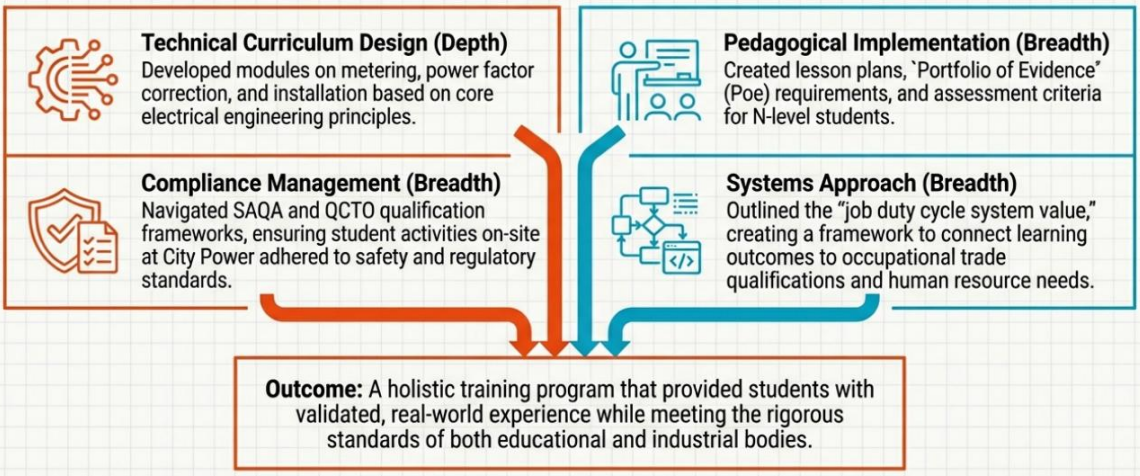
Synthesis in Action: Integrating Engineering, Education, and Policy at City Power & St Peace College.

Led initiatives to bridge the gap between academic engineering studies and practical industry requirements for students and trainees.


Technical Curriculum Design (Depth)
Developed modules on metering, power factor correction, and installation based on core electrical engineering principles.
Pedagogical Implementation (Breadth)
Created lesson plans, `Portfolio of Evidence' (Poe) requirements, and assessment criteria for N-level students.
Compliance Management (Breadth)
Navigated SAQA and QCTO qualification frameworks, ensuring student activities on-site at City Power adhered to safety and regulatory standards.
Systems Approach (Breadth)
Outlined the "job duty cycle system value," creating a framework to connect learning outcomes to occupational trade qualifications and human resource needs.
Outcome: A holistic training program that provided students with validated, real-world experience while meeting the rigorous standards of both educational and industrial bodies.
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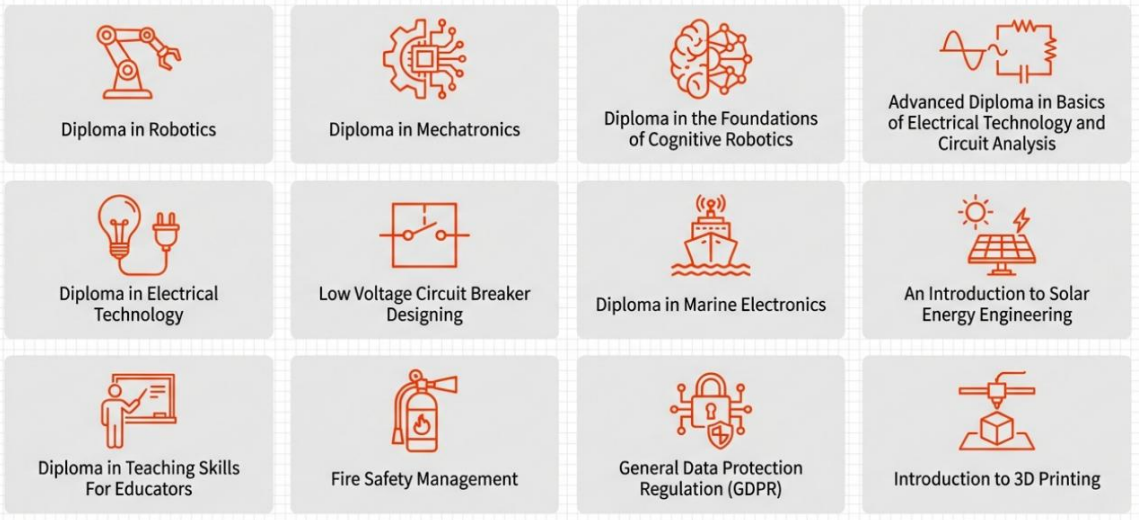
A Portfolio of Continuous Learning and Skill Expansion.


Diploma in Robotics
Diploma in Mechatronics
Diploma in the Foundations of Cognitive Robotics
Advanced Diploma in Basics of Electrical Technology and Circuit Analysis
Diploma in Electrical Technology
Low Voltage Circuit Breaker Designing
Diploma in Marine Electronics
An Introduction to Solar Energy Engineering
Diploma in Teaching Skills For Educators
Fire Safety Management
General Data Protection Regulation (GDPR)
Introduction to 3D Printing
All certificates and diplomas completed via the Alison learning platform.
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The Tshingombe Tshitadi Fiston Value Proposition

A uniquely qualified professional who integrates four critical domains to deliver robust, intelligent, and sustainable solutions.

1. Deep Technical Mastery

Expert-level knowledge of electrical systems, from fundamental theory to complex industrial machinery and electronics.

2. Systematic Rigor & Automation

The ability to analyze, design, and automate complex processes using software, logic, and a structured, systematic approach.

3. In-Depth Regulatory Awareness

A practitioner who ensures solutions are not only technically sound but also safe, compliant, and aligned with national and international standards.

4. A Knowledge Multiplier

An inherent capacity to teach, train, and develop competence in others, enhancing team capabilities and ensuring lasting project value.

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Ready to apply integrated engineering expertise to solve complex challenges.

Email: tshingombefiston@gmail.com

GitHub: github.com/Kananga5

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The Modern Engineer's Skill Journey

Diverse Skill Development

Core Engineering Foundation

Deep Focus on Electrical Engineering

Specializing in electrical trade theory, electrotechnics, industrial electronics, and power systems

Pursuit of Formal Qualifications

Engaging with bodies like SAQA, NRF, and DHET for certifications and grants

Emphasis on Practical Application

Training includes hands-on experience in labs, workshops, and site visits

Expansive Online Learning

Completed a wide array of online diplomas and certificates from platforms like Alison

Mastery Across 15+ Subject Areas

Skills range from Robotics and Cybersecurity to Fire Safety and Soft Skills

Tools for Career Advancement

Actively uses career planning guides, résumé builders, and professional aptitude tests

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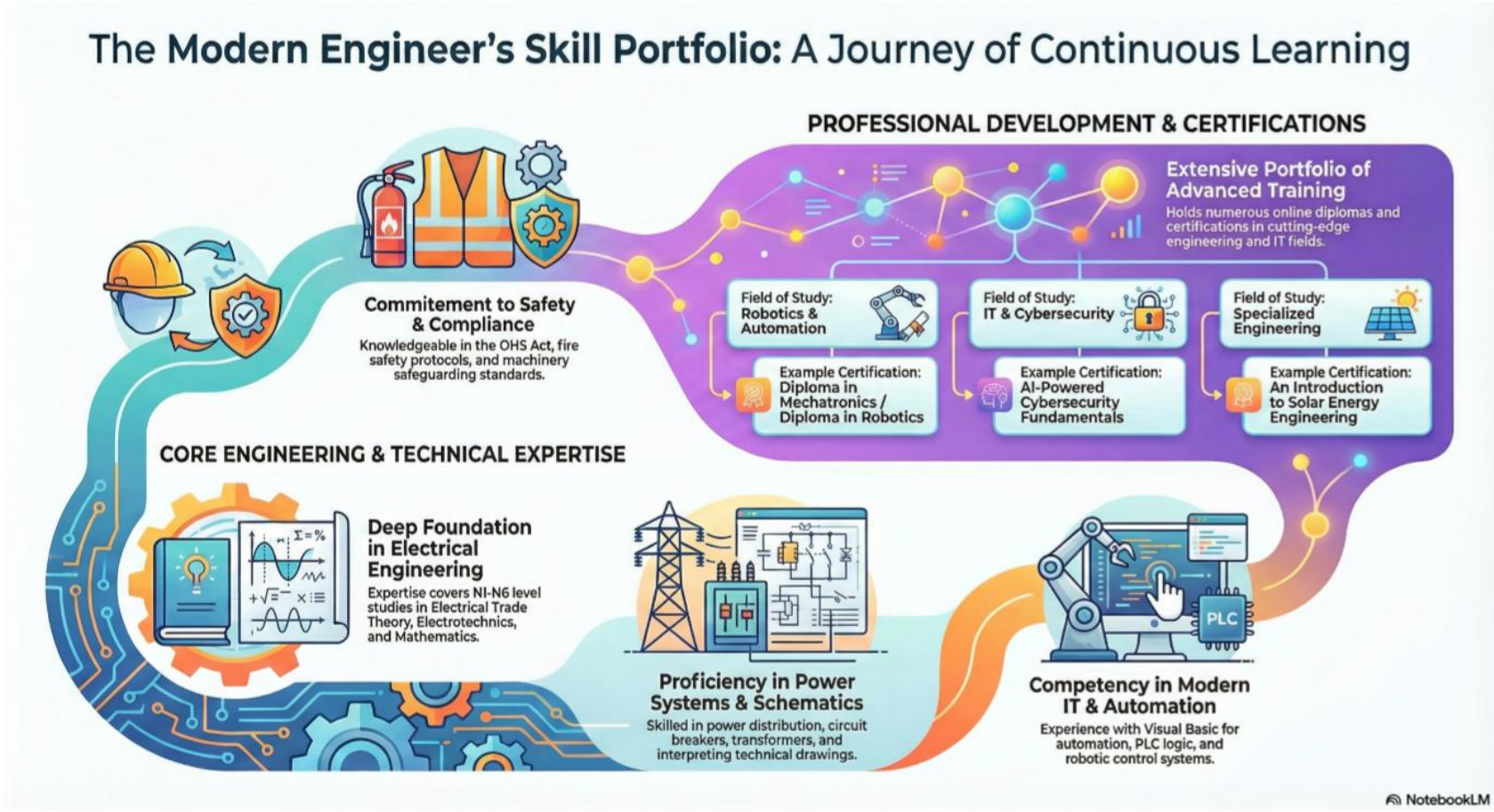
The Modern Engineer's Skill Portfolio: A Journey of Continuous Learning
PROFESSIONAL DEVELOPMENT & CERTIFICATIONS
Extensive Portfolio of Advanced Training
Holds numerous online diplomas and certifications in cutting-edge engineering and IT fields.
Field of Study: Robotics & Automation
Example Certification: Diploma in Mechatronics / Diploma in Robotics
Field of Study: IT & Cybersecurity
Example Certification: AI-Powered Cybersecurity Fundamentals
Field of Study: Specialized Engineering
Example Certification: An Introduction to Solar Energy Engineering
Commitement to Safety & Compliance
Knowledgeable in the OHS Act, fire safety protocols, and machinery safeguarding standards.
CORE ENGINEERING & TECHNICAL EXPERTISE
Deep Foundation in Electrical Engineering
Expertise covers NI-N6 level studies in Electrical Trade Theory, Electrotechnics, and Mathematics.
Proficiency in Power Systems & Schematics
Skilled in power distribution, circuit breakers, transformers, and interpreting technical drawings.
PLC
Competency in Modern IT & Automation
Experience with Visual Basic for automation, PLC logic, and robotic control systems.
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The Modern Professional's Skill Stack
Core Technical & Engineering Skills
Essential Professional & Safety Competencies
Building Digital Competencies
Acquiring skills in software engineering, cybersecurity, 3D printing, and AI.
Developing Management & Soft Skills
Enhancing communication, leadership, and continuous improvement (Kaizen) methods.
Integrating Automation & Robotics
Learning to design and control mechatronic systems with microcontrollers and PLCs.
Understanding Critical Infrastructure
Studying power distribution, backup generators, UPS systems, and facility security.
Mastering Electrical Engineering
Deepening knowledge in circuit analysis, transformers, and AC/DC machine theory.
Championing Workplace Safety
Gaining certifications in fire safety, rigging, lifting, and OHS Act compliance.
Certified
OHS Act
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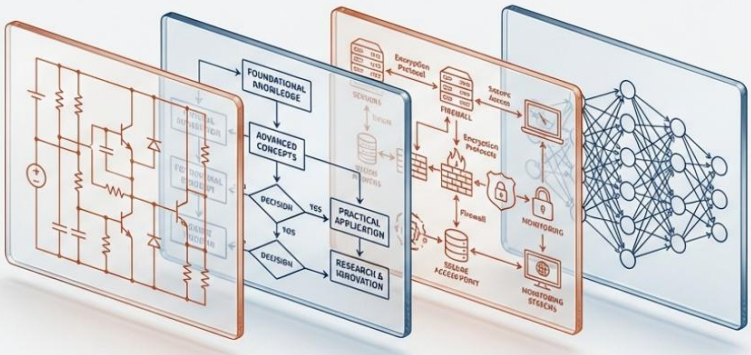

The Synthesis of a Modern Polymath

Profiling a professional who integrates deep expertise in Engineering, Education, Security Systems, and AI to solve complex, modern challenges.

This deck outlines a unique capability forged at the nexus of technology, pedagogy, and regulatory systems. The narrative is not about disparate skills, but about their powerful synthesis.

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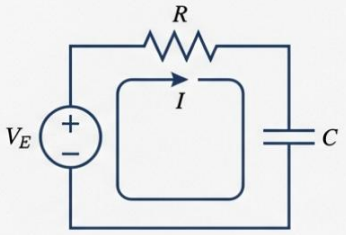
Pillar I: The Engineer's Foundation – A Mastery of First Principles

Deep fluency in the fundamental laws and advanced applications of electrical and systems engineering, from component-level physics to large-scale power systems.



$$V_E = RI + V_s$$

Core Theoretical Knowledge

- Kirchhoff's & Ohm's Laws
- Thevenin's & Norton's Theorems
- AC/DC Circuit Analysis (Series, Parallel, RLC Circuits)
- Maxwell's Equations & Electromagnetic Field Theory
- Three-Phase Systems & Power Factor Correction
- Control Systems & Feedback Loops

$$\tau.(p.y(P) - y(0^-)) + y(P) = k.u(P)$$

Equation for a first-order linear system response.

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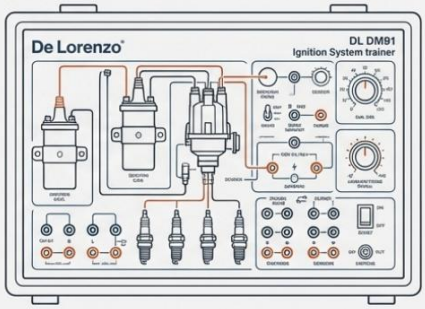
Engineering in Practice: From Industrial Automation to Defense Systems

Expertise is demonstrated through hands-on application with industry-standard equipment and adherence to stringent quality and safety protocols.



Industrial & Commercial Systems

- **Equipment Proficiency:** Schneider Electric (MCCBs), De Lorenzo (Didactic Labs), Eaton.
- **Applications:** Panel wiring, power distribution, motor control circuits, substation technology, SABS/SANS compliance.
- **Diagnostics:** Use of Murray and Varley Loop Tests for fault location in underground cables.

High-Reliability & Defense Systems

- **Standards:** Familiarity with military specifications (e.g., MIL-STD 139 for nameplates, thermal shock testing, radiation hardening requirements for ICs).
- **Environments:** Experience relevant to military, aerospace (radioisotope thermionic generators), and high-shock applications.

MIL-STD Environmental Requirements

Test Condition	Specification
Thermal Shock	-55°C to +125°C, rapid transition
Vibration Fatigue	Specified G-force and frequency sweep
Dose Rate (Upset)	> 10^8 rad(Si)/s
Neutral Irradiation	> 10^13 n/cm²

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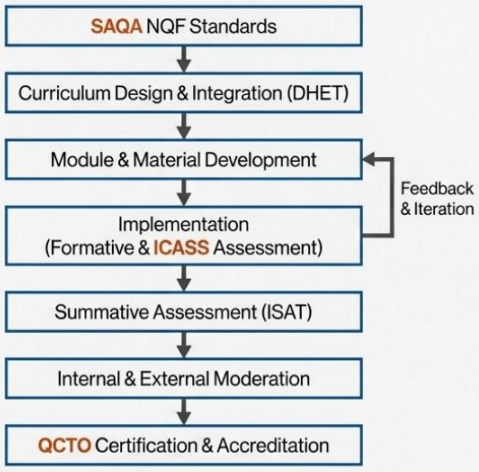
Pillar II: The Educator's Framework – Engineering Pedagogy

The application of systems thinking and engineering principles to design, assess, and implement effective technical and vocational education programs.

Key Frameworks

- **National Qualifications Framework (NQF):** Deep understanding of SAQA, QCTO, and DHET regulations, NQF levels (1-10), and credit accumulation.
- **Curriculum Design:** Designing and integrating curricula for subjects like Civil, Electrical, and Mechanical Technology.
- **Assessment Architecture:** Expertise in formative, summative, ICASS, and ISAT methodologies. Creating assessment grids with cognitive levels (Knowledge, Application, Analysis).



"An instructor evaluates laboratory reports for technical accuracy. In addition, two of the reports are selected for a more comprehensive evaluation with numerical scores applied to content and writing skills."

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The Didactic System in Action: From Lab Modules to Workplace Integration

Developing practical, hands-on learning experiences that are directly aligned with industry needs and qualification requirements.

Vocational Training Modules

- Detailed electrician trade modules: Safety (5S System, Fire Triangle), Hand Tools (Pliers, Screwdrivers per BIS standards), AC/DC Circuits, Earthing (per SABS 0142), and Workshop Practice.

Work-Based Learning (WBL) Models

- Designing apprenticeship models that integrate college education with practical company experience, referencing tripartite agreements (learner, employer, provider).

Psychometric & Aptitude Testing

- Integration of assessments (Mechanical Aptitude, Logical Reasoning) to align learner capabilities with career pathways.

Sample Weekly Instruction Flow: Electrician Apprentice

Day	Theoretical Focus (College)	Practical Application (Workshop)
Monday	Safety Regulations & SABS 0142 (Earthing)	Workshop Safety Tour & 5S System Implementation
Tuesday	Ohm's Law & Basic DC Circuits	Building and testing simple series/parallel circuits on breadboard
Wednesday	Hand Tool Identification & BIS Standards	Practical exercise: Filing, hacksawing, and drilling techniques
Thursday	Introduction to AC Waveforms	Workshop practice: Coil winding and termination
Friday	Weekly Review & Formative Assessment	Practical skills validation and logbook entry

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Pillar III: The Security Strategist – A Systems Approach to Risk & Regulation

Applying analytical rigor and procedural discipline to security operations, criminal investigation, and regulatory compliance.

Domains of Expertise

- **Private Security Industry:** In-depth knowledge of PSIRA regulations, security service provider accreditation, grades (E to A), and code of conduct.
- **Law Enforcement & Criminal Justice:** Understanding of SAPS mandate (Section 205), investigation processes (scene of crime, evidence collection, docket management), and court testimony.
- **Labor Law & Compliance:** Knowledge of CCMA dispute resolution, the Labour Relations Act (LRA), and procedures for disciplinary hearings and arbitration.

Criminal Justice Process Flow

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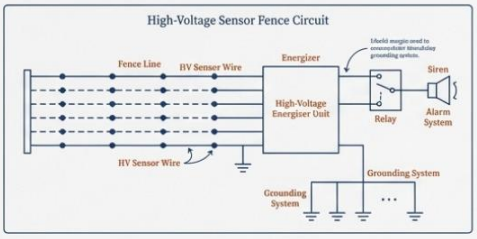
Security Technology & Infrastructure: From Forensics to Fortification

Mastery over the technology and hardware used to prevent, detect, and investigate security threats.

Technology & Systems

- **Surveillance Systems**: Specifications for CCTV cameras, including resolution ('429 TVL'), pixel count ('PAL: 512(H)×582(v)'), and features (AGC, White Balance).
- **Forensic Technology**: Understanding of specialized units like the Ballistics Unit (Internal, External, Terminal Forensics) for firearm and tool mark examination.
- **Physical Security**: Design and specifications for intelligence fencing systems, including high-voltage sensors, alarm integration, and grounding requirements.
- **Access Control**: Knowledge of asset protection, patrol procedures, and threat assessment in a defined operational area.

Feature	Specification
Horizontal Resolution	429 TVL
Effective Pixels (PAL)	512(H) × 582(V)
Shutter Speed	Auto (1/50 - 1/100,000s)
Synchronization	Internal



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Pillar IV: The Digital Frontier – AI, Data, and Future Systems

A commitment to mastering emerging technologies, with a focus on Artificial Intelligence, data engineering, and their practical applications.

AI & Machine Learning Foundations

- **Core concepts**: AI as "machines learning from data to make predictions," AI vs. ML distinction, Turing Test.
- **Real-world applications**: LinkedIn connection suggestions, music streaming recommendations.

Data Engineering & Cloud Skills

- Highlights specific Microsoft credentials for Azure and Microsoft Defender, demonstrating practical cloud security and data management skills.

Advanced & Emerging Concepts

- Current studies in Quantum Computing, Neural Networks for Medical Imaging, and Intent-Based Networking (IBN).

Verified Credentials:

"Introduction to Data Engineering on Azure"
"Secure data and manage user in Azure Synapse"
"Perform device investigation in Microsoft Defender for Endpoint"

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The Synthesis: A Unified System of Thinking

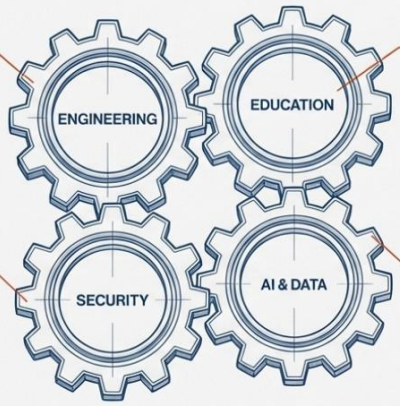
The future of industry and education requires professionals who can integrate knowledge from multiple domains. True innovation arises not from siloed expertise, but from applying principles from one field to solve challenges in another.

Feedback Loops

Control system theory (Engineering) is applied to curriculum improvement (Education) and autonomous security responses (Security).

Risk Analysis

Fault-tree analysis (Engineering) is used for security threat assessment (Security) and identifying failure points in educational delivery (Education).



Pattern Recognition

Signal processing techniques (Engineering) are foundational to machine learning models (AI) and criminal activity analysis (Security).

System Architecture

Designing robust electrical grids (Engineering) informs the creation of scalable learning platforms (Education) and resilient security networks (Security).

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Navigating Siloed Systems: The Challenge of Multidisciplinary Recognition

A forward-thinking, integrated skill set often encounters friction from traditional, single-domain institutions. This journey of seeking recognition is evidence of a profile that defies conventional categorization.

Systematic Engagement with Regulatory & Legal Bodies

- **DHET & SAQA** — Extensive correspondence re: NATED qualification irregularities, foreign qualification evaluation.
- **QCTO** — Engagement on occupational qualification frameworks and policy.
- **CCMA & Labour Court** — Case Numbers: GAjb6808-15, JR 2461/15
- **Inspector-General of Intelligence** — Ref: OIG/IG10(IG80)/6/1/14/5 – Escalation of data integrity issues.

Narrative Reframing

This is not a history of conflict, but a data-rich record of advocating for a modern, integrated professional standard in the face of bureaucratic inertia.

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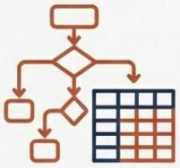
A Portfolio of Integrated Practice

The synthesis of skills is demonstrated through a comprehensive and diverse body of work that spans technical design, educational development, project proposals, and legal documentation.

Technical & Engineering Documents

- Schematics, circuit diagrams, trade test results, logbooks from City Power/Eskom, SABS compliance checks.



Educational Materials

- Curriculum frameworks, assessment rubrics, learner portfolios (PoE), didactic module plans.

Proposals & Tenders

- NSF CAREER Proposals, project plans for rural electrification (50W Solar Home Systems), bids for PSIRA security services.

Legal & Regulatory Filings

- Affidavits on exam irregularities, CCMA referrals, intellectual property license requests (Met Police), UIF/COID applications.

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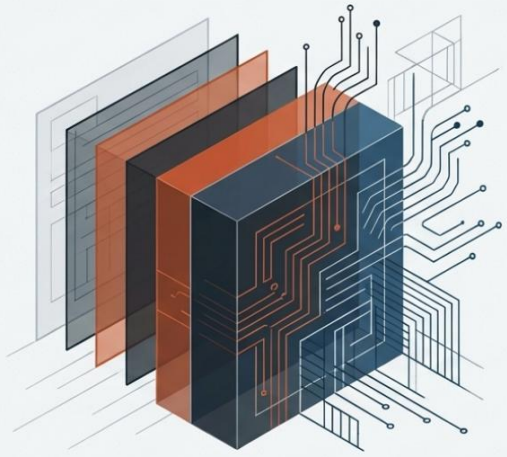
The Modern Polymath: A Strategic Asset for a Complex World

The convergence of deep engineering knowledge, systematic educational design, robust security strategy, and a grasp of future technologies creates a unique problem-solver—one capable of designing, building, teaching, and securing the systems of tomorrow.

- **Analyze and Design Complex Systems:** From electrical grids and industrial automation to educational frameworks and security protocols.
- **Bridge the Theory-Practice Gap:** Translate high-level strategic goals into practical, hands-on implementation and training.
- **Operate Across Domains:** Navigate the intersections of technology, regulation, and human capital to deliver holistic and resilient solutions.

> *This is the profile of an integrator—a professional uniquely equipped to lead in an era defined by interconnectedness and rapid technological change.*



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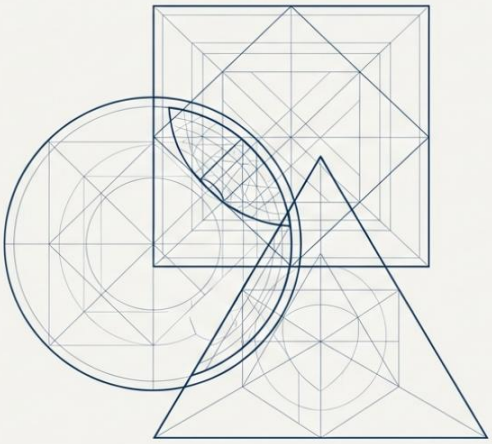
The Synthesis of a Modern Polymath: Integrating Systems Across Engineering, Education, and Security

A professional profile of Tshingombe Tshitadi Fiston, demonstrating the power of applied systems thinking to solve complex, multi-domain challenges.



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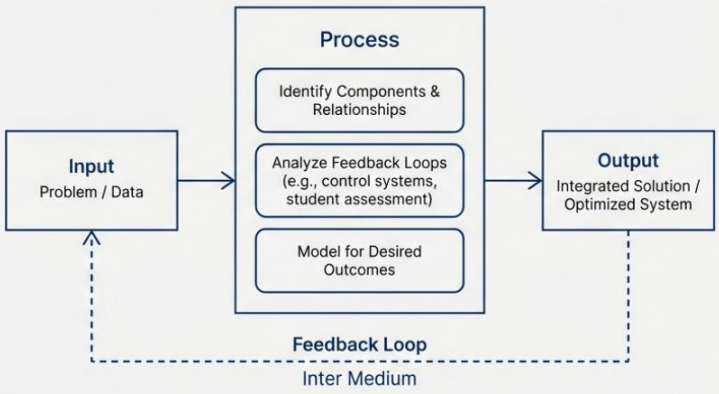
The Core Methodology: Applied Applied Systems Thinking

This profile is built on a single, powerful principle: **the application of systems thinking across disciplines.**

Every challenge—whether designing a circuit, developing a curriculum, or assessing a security risk—is approached as a system of interconnected variables, feedback loops, and desired outcomes.

This methodology moves beyond siloed knowledge to create integrated, resilient solutions.



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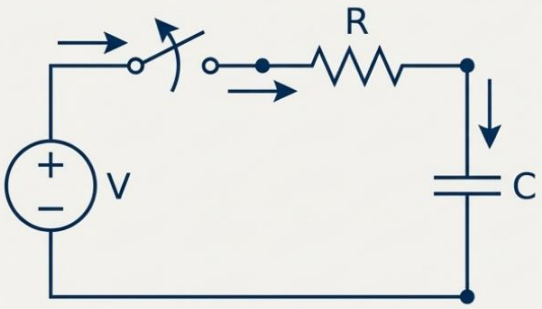
Pillar I: Mastery of Electrical & Electronic Engineering

Deep, component-level knowledge of electrical systems, from fundamental laws to industrial application. The expertise covers power systems, electronics, control theory, and telecommunications, grounded in both theoretical rigor and practical application.



Theoretical Foundations

Instantaneous Power: $P(t) = U_R \cdot I_R + U_S \cdot I_S + U_T \cdot I_T$

Thevenin's Theorem & Nodal Analysis

Kirchoff's Laws

Maxwell's Equations

AC Machine Principles: $G_{em} = K_{AE} \cdot (U - K_{AE}\,\omega) / R$

Practical Application & Standards

- **Equipment Expertise:** Schneider Electric, De Lorenzo, Eaton, Leroy Somer
- **Standards Compliance:** SABS 0142, NEC (National Electrical Code), MIL-STD-139
- **Skills:** PCB Design, Panel Wiring, AC/DC Motor Analysis, Autotronics

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Pillar I: Engineering Deep Dive - Core Competencies

Power Systems & Control

- Generation, Transmission, Distribution
- Fault Analysis (Symmetrical & Asymmetrical)
- Process Control & Instrumentation (PLCs, SCADA)
- Renewable Energy Systems (Solar, Wind, Hybrid)
- Power System Analysis & Stability

Electronics & Telecommunications

- Digital Logic & Computer Systems (Binary, Hexadecimal)
- Microelectronics & Semiconductor Devices
- Signal Processing (Analog & Digital)
- Communication Systems (Wireline, RF, Fiber Optic)
- Medical Imaging & Image Processing

Applied Mechanics & Materials

- Mechanotechnics & Thermodynamics
- Fluid Mechanics
- Strength of Materials
- Forensic & Geotechnical Engineering

Design & Drawing

- Engineering Drawing Instruments & Standards
- Isometric & Axonometric Projections
- Architectural Drawings (Floor Plans, Site Plans)

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Pillar II: Architect of Technical Education

Engineering expertise is amplified by a deep capability in designing and assessing educational programs. This involves structuring curricula, developing learning materials, and aligning vocational training with rigorous national and international standards.

Frameworks & Standards

- **SAQA & NQF:** Deep familiarity with South African Qualifications Authority levels (N1-N10), credits, and qualification design.
- **QCTO & SETAs:** Experience with Occupational Qualifications (OFO codes) and Sector Education and Training Authorities (merseta, sasseta, chieta).

Curriculum & Assessment Design

- **Didactic Methodology:** Designing learning experiences with clear objectives, from psycho-motor skills to cognitive analysis.
- **Assessment Tools:** Development and use of ICASS (Internal Continuous Assessment), ISAT, formative/summative evaluations, moderation grids, and Portfolios of Evidence (PoE).
- **Learning Models**: Application of experiential learning, work-integrated learning (WBL), and apprenticeship models.

Define NQF Level & Outcomes
Design Curriculum & Learning Materials (PoE)
Implement Training (WBL & Apprenticeship)
Conduct Formative & Summative Assessments (ICASS/ISAT)
Final Moderation & Trade Test Certification

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Pillar III: Engineering Security & Regulatory Systems

The principles of system design and analysis are applied to the fields of physical security, criminal investigation, and regulatory compliance. This involves understanding legal frameworks, operational procedures, and the technological backbone of modern security.

Security Industry Regulation	Law Enforcement & Forensics	Technical Security Systems
• **PSIRA**: Knowledge of the Private Security Industry Regulatory Authority, including grading, training accreditation, and codes of conduct. • **Threat Assessment**: Conducting security threat and risk assessments in defined operational areas.	• **SAPS Mandate**: Understanding of the South African Police Service constitution and mandate (Section 205). • **Investigative Process**: Familiarity with evidence collection, crime scene investigation, ballistics, and giving evidence in court. • **Data Systems**: Knowledge of Law Enforcement Record Management Systems (RMS), data flow diagrams (DFDs), and entity-relationship diagrams (ERDs).	• **Surveillance**: CCTV specifications (e.g., Pixels: 512(H)x582(V), Horizontal Resolution: 420 TVL). • **Access Control & Fencing**: High-voltage sensor fences, asset protection protocols.

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Pillar IV: Integrating Emerging Technologies

A proactive focus on the next generation of technology, integrating principles of Artificial Intelligence, advanced computing, and data science into engineering and educational contexts.

Artificial Intelligence & Machine Learning

- **Core Concepts:** Completion of 'AI Fluency' program covering Generative AI, Responsible AI, and Microsoft Copilot.
- **Application:** Understanding of AI in diagnostics, pattern recognition (e.g., LinkedIn connection suggestions), and predictive analytics.

Advanced Computing

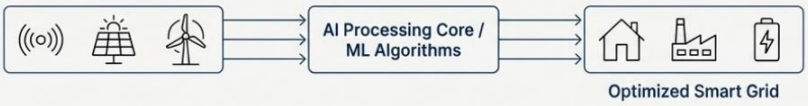
- **Quantum Computing:** Familiarity with concepts like Quantum Gates, Circuits, Algorithms, and Information Theory.
- **Proof Theory:** Deep knowledge of mathematical proofs (contradiction, induction) central to certifying software and hardware.

Data Systems & IoT

- **Big Data:** Experience with Apache Spark for analyzing structured/unstructured data.
- **Internet of Things (IoT):** Knowledge of IoT system architecture (sensors, actuators, MQTT protocol) via De Lorenzo modules.

Sustainable & Smart Systems

- **Renewable Energy Integration:** Principles of integrating solar and wind power into grid systems.
- **Grid Optimization:** Strategies for enhancing efficiency and stability in smart grids.
- **Smart City Infrastructure:** Understanding of interconnected urban systems for improved resource management.



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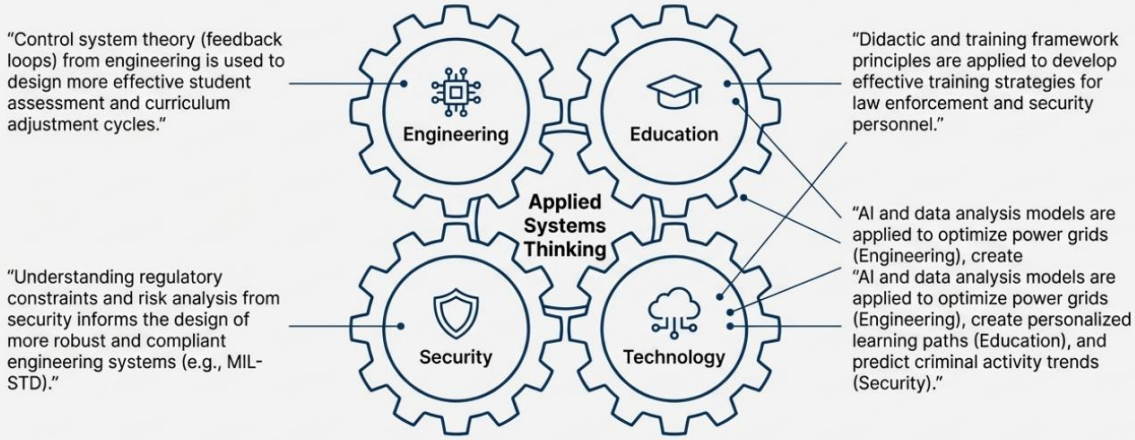
The Synthesis: How the Pillars Integrate


"Control system theory (feedback loops) from engineering is used to design more effective student assessment and curriculum adjustment cycles."
Engineering
Education
Applied Systems Thinking
Security
Technology
"Didactic and training framework principles are applied to develop effective training strategies for law enforcement and security personnel."
"AI and data analysis models are applied to optimize power grids (Engineering), create
"AI and data analysis models are applied to optimize power grids (Engineering), create personalized learning paths (Education), and predict criminal activity trends (Security)."
"Understanding regulatory constraints and risk analysis from security informs the design of more robust and compliant engineering systems (e.g., MIL-STD)."

This is not a collection of separate skills, but a unified problem-solving engine. Each domain informs and strengthens the others, creating a capability greater than the sum of its parts.

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Evidence of Application: Certifications & Projects

Professional Certifications & Training

- **Microsoft**: "Introduction to Data Engineering on Azure"
- **Schneider Electric:** Certificate of Completion
- **Alison CPD:** Diploma in Engineering Studies, Security & Forensics
- Cyber Security Certificate (BrightTalk)

Key Projects & Proposals

- **Rural Electrification:** Project proposal for supplying electricity to rural homes using 50-watt solar home systems (SHS).
- **NSF CAREER Proposal:** Framework for experimental career learning integrating university work and industry practice.
- **Didactic Systems:** Design of didactic materials and experimental panels for teaching electrical engineering (e.g., tangram, compass, series/parallel panel).

Technical Documentation & Authored Works

- Thesis & Publications
- "Building curriculum assessment"
- Development of learner workbooks and assessment guides (e.g., for Sasseta).

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Case Study: Navigating Complex Regulatory Systems

A multi-year engagement with national qualifications and labor-relations bodies demonstrates an expert ability to navigate, document, and challenge complex administrative systems. This journey showcases resilience, meticulous **record-keeping**, and a deep, practical understanding of regulatory frameworks from both sides of the table.

DHET / SAQA / Umalusi
Submitted affidavits, academic records, and Portfolios of Evidence regarding NATED exam irregularities (e.g., N3 Electrical Trade Theory).
Reference: St Peace College, Shalom Technical, specific exam dates.

CCMA (Commission for Conciliation, Mediation and Arbitration)
Filed and pursued labor dispute cases.
Reference: Case Numbers GAJB6808-15, JR 2461/15.

Inspector-General of Intelligence (OIGI)
Lodged formal complaints regarding data integrity.
Reference: OIG/IG10(IG80)/6/1/14/5.

Various SETAs (Sasseta, Merseta)
Engaged on topics of accreditation, assessment, and learnerships.

This experience provides a unique, un-fakeable insight into the practical realities of policy implementation, dispute resolution, and institutional accountability.

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The Thesis: The Future is Interdisciplinary

The complex challenges of the 4th Industrial Revolution—from smart grid implementation to AI ethics and lifelong education—cannot be solved by siloed expertise. The future belongs to professionals who can synthesize knowledge across domains, applying the rigor of engineering, the empathy of education, and the pragmatism of security to build holistic, human-centric systems.

Industry requires engineers who understand policy and can train their teams.
Education needs leaders who understand the technology they are preparing students for.
Governance needs policymakers with a deep, technical understanding of the systems they regulate.

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Vision in Action: A Proposal for Rural Energy Systems

Project: Supply of electricity to rural residential homes in Africa (RSA) through a hybrid grid/off-grid model.
Technology: 50-watt Solar Home Systems (SHS) producing 0.3-0.4 kWh/day, supplemented by mini-hydro and thermal solutions to counter loadshedding.
Systemic Approach: **This is not just an infrastructure project; it's an integrated socio-economic development plan.**

Pillar	Contribution to the Project
Engineering	Design of hybrid PV-based systems, ensuring grid stability, and defining technical specifications for hardware (e.g., plasma dynamic generators).
Education	Development of training programs for local technicians on installation, maintenance (TPM), and system operation. Creation of user-friendly documentation.
Security	Designing systems to prevent theft and ensure safety (e.g., proper earthing, SANS compliance). Navigating regulatory and land-use frameworks.
Technology	Implementing smart metering and AI-driven load balancing for efficient energy distribution and predictive maintenance.

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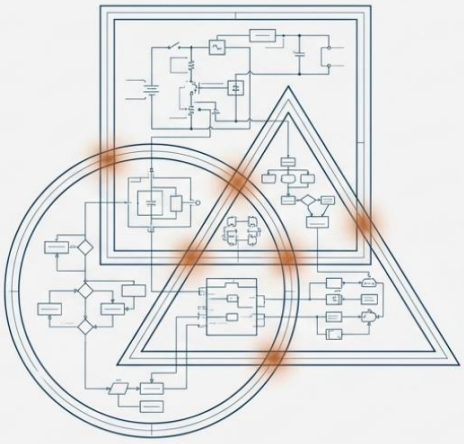
Profile Summary: The Systems Integrator

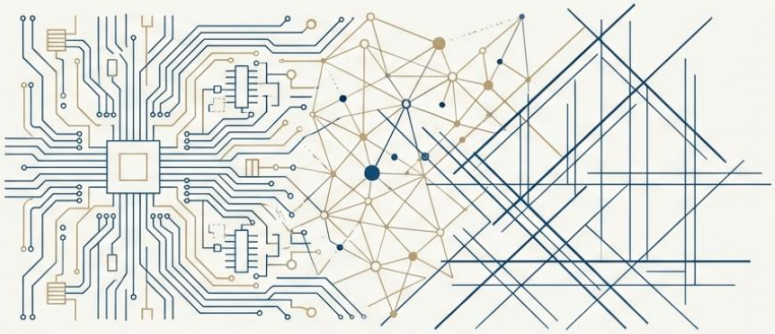
- **A Polymath Engineer** who designs and builds robust electrical and electronic systems.
- **An Educational Architect** who develops curricula and frameworks to build technical competency in others.
- **A Regulatory Navigator** who understands and operates within complex legal and security frameworks.
- **A Future-Focused Technologist** who integrates AI and data science to create intelligent, adaptive systems.



The capacity to not only understand these distinct systems but to synthesize them into a cohesive whole is the definitive skill for driving innovation and solving the critical challenges of our time.

NotebookLM

The Making of a Multidisciplinary Technologist: An Evidentiary Portfolio



Presenting a consolidated view of **theoretical mastery**, **vocational excellence**, and **strategic systems thinking** in engineering and technology.

Presented by: Tshingombe Tshitadi Fiston

NotebookLM

A Synthesis of Comprehensive Engineering Competence
This portfolio provides evidence of advanced, multi-domain capabilities, organized into three core pillars:
1.
Theoretical & Academic Mastery
A deep, formal understanding of the foundational principles of engineering, mathematics, and computer science.
2.
Applied Engineering & Vocational Excellence
Demonstrated, hands-on proficiency in industry-standard practices, diagnostics, and modern didactic systems.
3.
Strategic Vision & Systems Thinking
The ability to analyze complex regulatory systems, propose innovative solutions to systemic challenges, and engage with frontier technologies.
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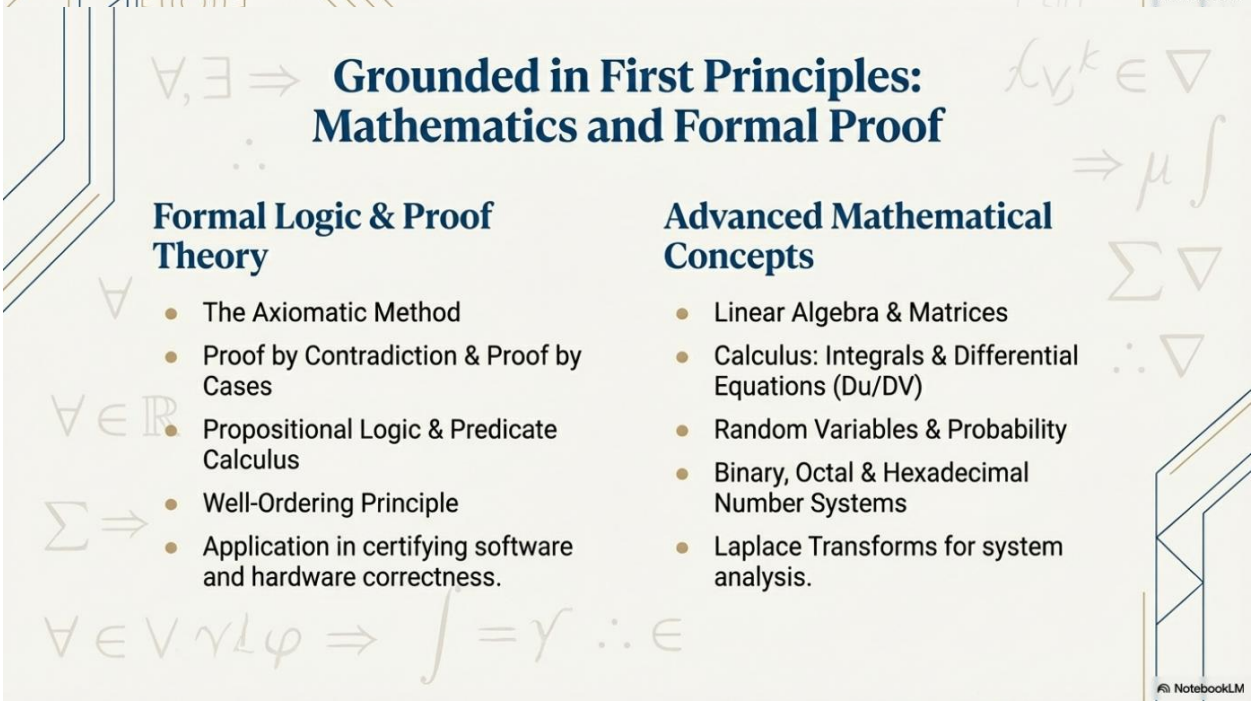
Grounded in First Principles: Mathematics and Formal Proof
Formal Logic & Proof Theory
The Axiomatic Method
Proof by Contradiction & Proof by Cases
Propositional Logic & Predicate Calculus
Well-Ordering Principle
Application in certifying software and hardware correctness.
Advanced Mathematical Concepts
Linear Algebra & Matrices
Calculus: Integrals & Differential Equations (Du/DV)
Random Variables & Probability
Binary, Octal & Hexadecimal Number Systems
Laplace Transforms for system analysis.
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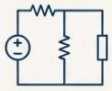
Mastery of Core Electrical Engineering Science

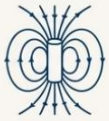


Circuit Theory

Kirchhoff's Laws, Ohm's Law, Thevenin's & Norton's Theorems, Series & Parallel circuits, R-L-C circuit analysis.

AC/DC Machinery

Principles of synchronous and asynchronous machines, creation of rotating magnetic fields (LeBlanc's Theorem), torque-speed characteristics.



Electromagnetism

Maxwell's Equations, magnetic circuits, hysteresis, induction, and flux.

Power Systems

Three-phase symmetrical and asymmetrical systems, power factor, reactive/real power, fault analysis.

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A Documented Trajectory Through the NATED Framework

Formal Educational Pathway

Successfully completed coursework and assessments for National Certificates N1 through N6 in Electrical Engineering.

Subjects included: Electrical Trade Theory, Industrial Electronics, Engineering Science, Mathematics.

Navigating Systemic Challenges

Documentation of extensive engagement with DHET, SAQA, and various assessment bodies to resolve documented examination irregularities. Evidence includes affidavits, official correspondence, and legal filings concerning delayed results and invalidation of specific subjects (e.g., N3 Electrical Trade Theory).

This rigorous process demonstrates profound resilience and a commitment to upholding qualification integrity.

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Validated by Industry Leaders

Microsoft:

- Introduction to Data Engineering on Azure
- Configuration of Network Security
- Device Investigation in Microsoft Defender
- Case Support: Visual Studio

Schneider Electric:

- Record of training in power products and systems (e.g., Compact NSX, MCCBs).

Eaton University:

- Experimental and theoretical career assessment in power management technologies.

Alison (CPD):

- Diploma in Engineering Studies
- Diploma in Security, Detective, and Forensic Science

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Comprehensive Proficiency in the Electrician's Trade

Demonstrated expertise across key areas of vocational practice, compliant with SABS/SANS standards:

Installation & Wiring

- Panel wiring, distribution boards, motor controls.
- Installation of wire ways (racks, trunking, conduit).
- Termination using glands, ferrules, and lugs.

Maintenance & Safety

- Application of Total Productive Maintenance (TPM) and Autonomous Maintenance principles.
- Implementation of the 5S System (Sort, Set in Order, Shine, Standardize, Sustain) for workshop organization.
- Expertise in safety protocols, including earthing, insulation, and personal protective equipment.

Diagnostics & Fault Finding

- Application of Murray and Varley loop tests for locating faults in underground cables.
- Use of test and measuring equipment for circuit verification and diagnostics.
- Competency in reading and interpreting complex schematic diagrams.

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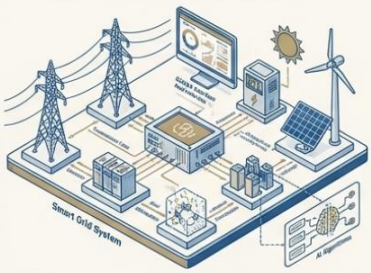
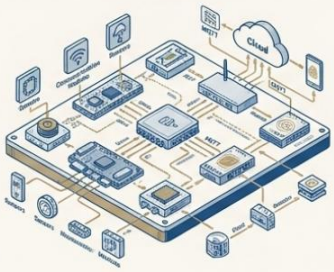
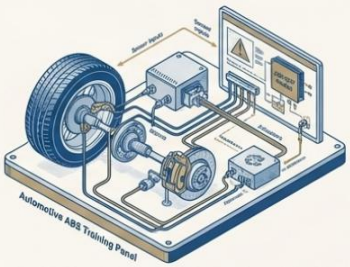
Expertise in Modern Didactic Systems for Engineering Education

In-depth knowledge of advanced hands-on training laboratories, demonstrating a capacity for curriculum design and next-generation skills development.







Familiarity with De Lorenzo (DL) Didactic Platforms:

- **DL POWER ENGINEERING & SMART GRID SYSTEMS**: Full-cycle training from generation to distribution, including AI modules for predictive load management and SCADA-WEB monitoring.
- **DL NGL (NEXT GENERATION LABS)**: Modular systems for frontier technologies, including:
  - **Big Data (DL NGL-DATA)**: Data science with Apache Spark and Python.
  - **Internet of Things (DL NGL-IOT)**: Simulating complete IoT systems with MQTT protocols.
  - **Cybersecurity (DL NGL-CYBER)**: Training on network vulnerabilities and encryption.
- **DL AUTOMOTIVE SYSTEMS**: Including ABS/ESP training panels and computerized trainers for phenomena like water hammer.

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A Blueprint for Impact: The NSF Career Proposal for Rural Electrification

"A strategic proposal submitted to the National Skills Fund (NSF) to address energy poverty and build technical capacity."

Supply of Electricity to Rural Households in RSA

Objective: To implement grid and off-grid electrification using a sustainable, multi-technology approach.

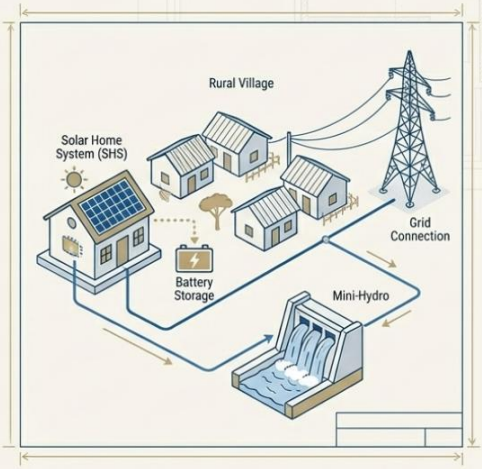
Proposed Technology:

- 50-watt Solar Home Systems (SHS) producing 0.3-0.4 kWh/day.
- Integration with battery storage, mini-hydroelectrical, and thermal generation.

Scope & Budget:

- Project budget not to exceed R550,000.00 (VAT inclusive).
- Includes supply, delivery, and installation of equipment like vacuum autoclaves.

Policy Context: Aligned with the Department of Energy's Integrated Energy Plan and challenges like loadshedding.



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Navigating the Intersection of Technology, Policy, and Law

A demonstrated capacity for systems-level analysis, gained through direct and rigorous engagement with national regulatory and legal frameworks.

Areas of Engagement & Analysis:

- **Qualifications Frameworks:** Deep analysis of SAQA, QCTO, and DHET policies, including qualification registration, accreditation, and the NQF Act.
- **Labour Law:** Direct experience with the CCMA and Labour Court, including case filings (e.g., GAjb6808-15), arbitration, and review processes.
- **Security Industry Regulation:** Understanding of PSIRA regulations, codes of conduct, and compliance for security service providers.
- **International Standards:** Research into the comparability of RSA (SABS/SANS) standards with European, UK, and North American legal and technical rules.

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Engaging with Frontier Technologies

A proactive pursuit of knowledge in technologies defining the Fourth Industrial Revolution:

Artificial Intelligence (AI/AGI)

- Completion of modules in the "AI Fluency Program" (Introduction to AI, Generative AI, Responsible AI).
- Study of AGI's economic implications, ethical considerations, and role in human–machine collaboration.

Quantum Computing

- Theoretical knowledge of quantum algorithms, gates, circuits, and information theory.

Internet of Things (IoT)

- Practical understanding of IoT system architecture, sensors, actuators, and MQTT protocols via didactic lab systems.

Cybersecurity

- Knowledge of network security configuration, device investigation, and vulnerability analysis at the OSI layer.

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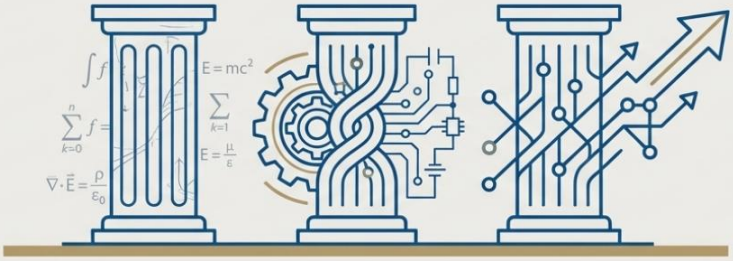
A Unique Synthesis of Theory, Practice, and Vision

This portfolio has demonstrated a unique and robust professional profile, built upon:



- **A Rigorous Theoretical Foundation**: Grounded in the formal logic of mathematics and the core sciences of electrical engineering.
- **Industry-Validated Practical Skill**: Proven hands-on competence, certified by global technology leaders and honed through mastery of the trade.
- **Forward-Looking Strategic Insight**: The ability to design solutions for complex socio-technical problems and to analyze the systems that govern them.

Conclusion: This represents a rare combination of a deep-thinking theorist, a master practitioner, and a strategic systems analyst.

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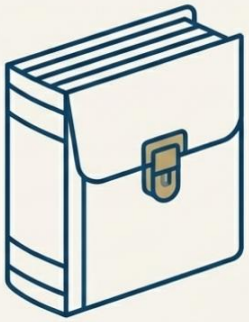
The Comprehensive Dossier



The complete and unabridged collection of certifications, academic records, legal correspondence, project proposals, and technical documentation referenced in this presentation is project proposals, and technicraall documentation referenced in this presentation is available as a comprehensive dossier for review.

This includes over 1,200 pages of primary source material, providing full context and verification for every point presented.

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The Tshingombe Dossier

An Evidentiary Framework for Advanced Qualification in Integrated Engineering & Didactic Systems

Fiston Tshitadi Tshingombe

CONFIDENTIAL DOCUMENT FOR QUALIFICATION AND PROFESSIONAL REVIEW

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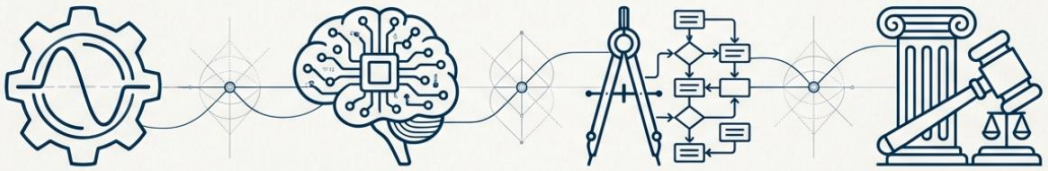
A Synthesis of Four Pillars of Expertise

This portfolio presents comprehensive evidence of a unique, integrated competency profile. The following exhibits will demonstrate mastery across four domains, arguing for a qualification that recognizes the synthesis of these distinct but interconnected fields.



Foundational & Electrical Engineering

Mastery of theoretical principles and hands-on application, from basic circuitry to complex power systems.

Advanced Didactic & AI Systems

Expertise in designing and implementing modern educational technologies and intelligent systems for technical training.

Curriculum & Assessment Architecture

Proven capability in structuring curricula, designing assessment tools, and aligning educational outcomes with national standards (NQF, SAQA).

Regulatory & Legal Navigation

Demonstrated ability to operate within and challenge complex legal and regulatory frameworks governing education, labor, and industry.

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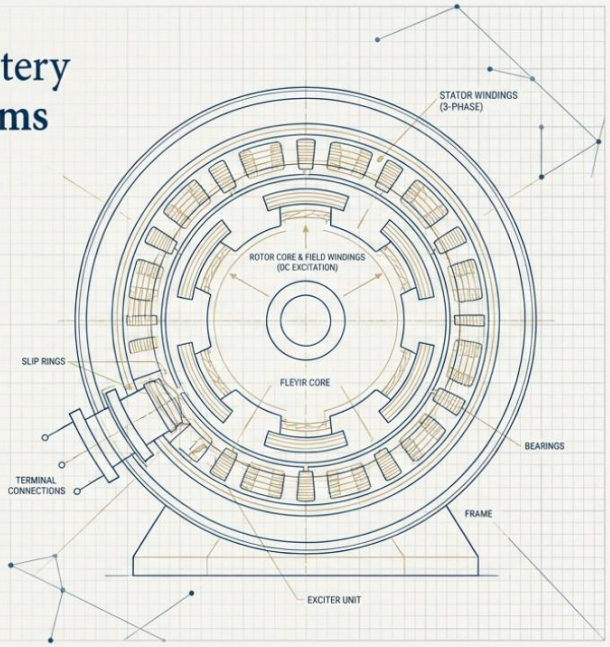
Exhibit A: Comprehensive Mastery of Electrical Engineering Systems

The foundation of this portfolio rests on a deep and verifiable command of electrical engineering, demonstrated through national qualifications, theoretical understanding, and practical, hands-on competencies in industrial and civil applications.

- National NATED Qualifications (N1-N6)
- AC/DC Circuit Theory and Analysis
- Electrical Machines and Power Systems
- Industrial Electronics and Instrumentation
- Panel Wiring, Installation, and Maintenance



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Evidence Block: Theoretical & Practical Engineering Proficiency

Theoretical Foundations

- Instantaneous Power: P(t) = UR.IR + US.IS + UT.IT
- Kirchhoff's Laws & Ohm's Law application examples.
- Impedance in RL/RC/RLC circuits: Z = sqrt(R^2 + (XL-XC)^2)
- Thevenin's Theorem and Superposition Principle.
- Magnetic Circuit Fundamentals: Hysteresis, Permeability.

Practical & Vocational Skills

- Industrial Electrician Competencies: Panel Builder, Automotive Electrician, Cable Jointer.
- Installation and inspection of equipment in explosive atmospheres.
- Fault location in underground power cables using Murray and Varley Loop Tests.
- Wiring of distribution boards, motor controls, and isolators to SABS 0142 standards.

Qualifications & Certifications

- National N Certificates (N1-N6) in Engineering Studies.
- Certificate of Completion: Schneider Electric (Work Expert).
- Diploma in Engineering Studies, CPD accredited: Alison.
- Microsoft Certifications: Introduction to Data Engineering on Azure.

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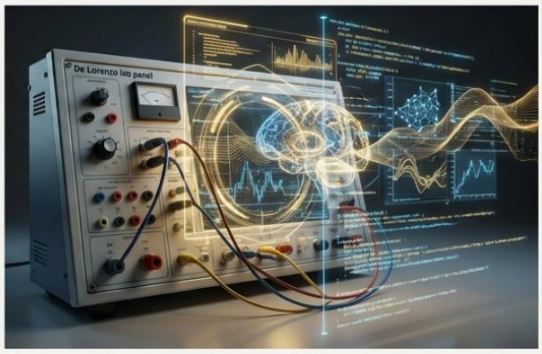
Exhibit B: Expertise in Advanced Didactic Systems & Future Technologies

Beyond traditional engineering, this portfolio demonstrates proficiency in the design and application of modern educational systems and emerging technologies, bridging the gap between hands-on training and the demands of Industry 4.0.

Key Areas of Focus

- AI-Enhanced Training Laboratories
- Virtual & Augmented Reality in Technical Education
- IoT, Big Data, and Cybersecurity Modules
- Quantum Computing and Systems Engineering
- AI Fluency & Application of Machine Learning Concepts



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Evidence Block: Application of Advanced Educational & Intelligent Systems

Advanced Didactic Laboratories

- Expertise with De Lorenzo systems: DL OPENLAB-SA-AI (Semi-Automatic Electric Machines Laboratory with AI), DL NGL (Next Generation Lab Modules).
- Familiarity with DSPACE Test Benches for real-time control simulation.
- Knowledge of SCADA-WEB platforms for remote monitoring and AI-driven predictive load management.

AI & Data Science

- Completed AI Fluency Program: Modules on Generative AI, Responsible AI, Microsoft Copilot.
- Understanding of ML concepts: Supervised/unsupervised learning, pattern recognition, predictive modeling.
- Application of Big Data modules (Apache Spark, Spark MLlib) for data analysis.

Emerging Technology Frameworks

- Theoretical knowledge of Quantum Computing in Systems Engineering (Quantum Algorithms, Gates, and Circuits).
- Design of IoT systems via DevIoT Unit: sensor/actuator control, MQTT protocol.
- Cybersecurity modules focusing on OSI layer vulnerabilities, encryption, and secure network configuration.

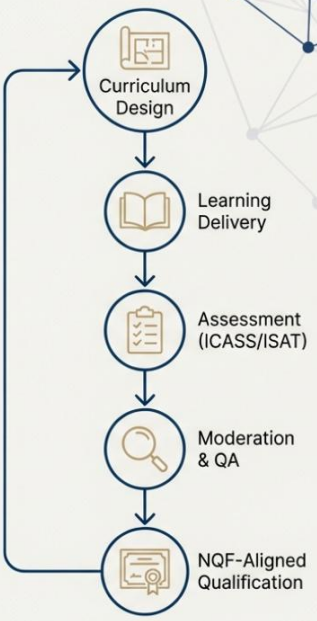
NotebookLM

Exhibit C: Architectural Proficiency in Curriculum & Assessment

Technical knowledge is maximized through effective pedagogical structures. This exhibit demonstrates a systematic approach to curriculum design, assessment methodology, and alignment with national qualification frameworks, ensuring that learning is measurable, rigorous, and relevant.

Key Areas of Focus

- National Qualifications Framework (NQF) & SAQA Alignment
- Design of Formative and Summative Assessments (ICASS/ISAT)
- Psychometric & Aptitude Testing Principles
- Work-Integrated Learning (WIL) Models
- Moderation and Quality Assurance Processes



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Evidence Block: Designing & Evaluating Educational Programs

Framework & Policy Alignment

- Deep knowledge of SAQA frameworks, Post-Graduate Diploma in Educational Technology structure (Field 05).
- Understanding of QCTO and SETA (MERSETA, SASSETA) mandates for occupational qualifications.
- Experience with curriculum design integrating technical subjects (e.g., Civil, Electrical, Mechanical Technologies).

Assessment & Moderation

- Design of assessment grids analyzing cognitive levels: Knowledge, Application, Analysis, Synthesis.
- Development of Portfolio of Evidence (PoE) requirements for trade tests.
- Familiarity with pre- and post-assessment moderation reports and procedures.

Learner Evaluation Methods

- Application of Psychometric and Aptitude Testing for career readiness (Logical Reasoning, Mechanical Aptitude).
- Analysis of learner performance data using statistical methods (variance, correlation, regression).
- Use of learning theories (Behaviorism, Cognitivism, Constructivism) to inform teaching methods.

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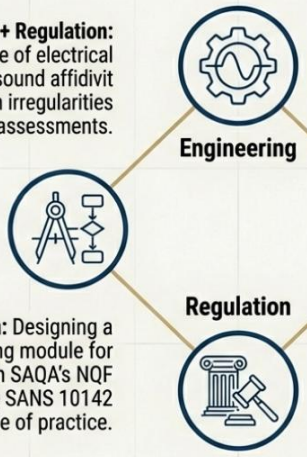
The Integration Point: Where Engineering, Didactics, and Systems Converge

Engineering + Regulation: Leveraging deep knowledge of electrical infrastructure to draft a legally sound affidivit challenging DHET on examination irregularities in N5/N6 Trade Theory assessments.

Engineering + Advanced Systems: Using AI-enhanced De Lorenzo labs to teach classic AC motor theory, allowing for fault simulation and predictive maintenance exercises not possible in traditional setups.



Curriculum + Regulation: Designing a Work-Integrated Learning module for electricians that meets both SAQA's NQF credit requirements and the SANS 10142 code of practice.

Advanced Systems + Curriculum: Developing an IoT-based practical assessment where students build a remote monitoring system, and their performance data is captured and analyzed in real-time.

NotebookLM

Exhibit D: Proven Navigation of Complex Regulatory & Legal Systems

True mastery is demonstrated by successfully applying expertise within complex, often adversarial, institutional environments. This exhibit provides evidence of sustained, high-level engagement with national qualification authorities, labor tribunals, and industry regulators to uphold standards and resolve systemic issues.

Key Systems Engaged

- Department of Higher Education & Training (DHET) & SAQA
- Commission for Conciliation, Mediation and Arbitration (CCMA)
- Private Security Industry Regulatory Authority (PSIRA)
- South African Police Service (SAPS) & Justice System

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Evidence Block: Documented Engagement with National Authorities

Education & Qualifications

- **SAQA**: Formal application for Foreign Qualification Evaluation and engagement on policy (Ref: Section 29(a), NQF Act 67).
- **DHET**: Formal dispute over N3-N6 examination irregularities, supported by affidavits and direct correspondence regarding invalid results and assessment backlogs.
- **OIGI**: Lodged formal complaint regarding alleged deletion of college records (Ref: OIG/IG10(IG80)/6/1/14/5), demonstrating knowledge of oversight channels.

Labor & Industrial Relations

- **CCMA**: Managed unfair dismissal case (Ref: GAjb6808-15), including rescission ruling, arbitration requests, and Labour Court review processes.
- Filed formal complaints citing specific clauses of the Labour Relations Act (LRA) and bargaining council agreements.

Security & Industry Regulation

- **PSIRA**: Understanding of registration requirements, code of conduct, and processes for appealing registrar decisions.
- **SAPS**: Knowledge of forensic procedures (ballistics), evidence handling (chain of custody), and criminal justice system protocols.
- Drafted legal documents including Notice of Motion, Affidavits, and Applications for Leave to Appeal.

NotebookLM

A Blueprint for the Future of Technical & Vocational Education

The evidence presented culminates in a coherent vision for reforming technical education in South Africa. This blueprint integrates practical skills, advanced technology, and robust pedagogical frameworks to address national priorities like the 4IR skills gap and rural development.

Integrated Curriculum Reform:

Update outdated trade theory with modules on smart grids, IoT, and renewable energy to align with MERSETA scarce skills.

AI-Powered Didactic Labs:

Implement De Lorenzo/DSPACE-style labs as a national standard for hands-on, simulated, and predictive learning.

Work-Integrated Portfolio Systems:

Formalize digital portfolios to track competencies, projects, and work-based learning, creating a direct link between TVET outcomes and employer needs.

Rural Electrification & Skills Development:

Launch projects modeled on the "Supply of electricity to rural house" proposal, using solar/hybrid systems as training grounds for a new generation of technicians.

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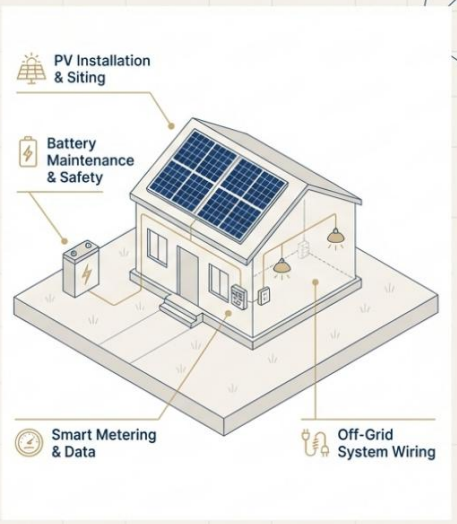
Case Study: The Rural Electrification Initiative

Project Abstract

A proposal for a national project to supply electricity to rural homes using hybrid systems. This initiative serves a dual purpose: addressing energy poverty and creating a real-world, project-based learning environment for TVET students.

Project Outline

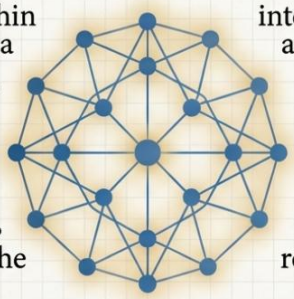
Component	Description
Technology	50-watt Solar Home Systems (SHS), PV-based hybrid systems, mini-hydroelectrical, and thermal solutions.
Educational Goal	Use installation and maintenance as the core of a Work-Integrated Learning program for electricians and technicians.
Curriculum Focus	Training in renewable energy, off-grid systems, smart metering, and community project management.
Funding Model	Based on NSF Career Proposal framework; seeks to align with government development plans and SETA discretionary grants.
Projected Impact	Development of a skilled workforce, sustainable energy access for rural communities, and a replicable model for skills-based infrastructure projects.



NotebookLM

A New Professional Archetype: The Integrated Engineering Didactician

The evidence contained within this dossier demonstrates a consistent, multi-faceted, and merely for the recognition of existing qualifications, but for the combines the sill of an engineer, the foresight of a systems analyst, curriculum architect, and the integrated, and dæphire syntiihersise. It makes the case not merely for the recoknowledgment of a new professional profile: one who hands-on skill of an engineer, the structural thinking of a resilience of a legal advocate.



This portfolio is presented as a definitive framework for an advanced qualification in Integrated Engineering and Didactic Systems, reflecting a competency profile ready to meet the complex challenges of modern technical and educational landscapes.

NotebookLM

Building Your Future: A Roadmap to a Technical Career in South Africa

PHASE 1: DISCOVER YOUR PATH

START WITH SELF-ASSESSMENT

Use psychometric tests to match your personal interests to a technical career path.

EXPLORE HIGH-DEMAND SECTORS

Research careers in Engineering, Chemical, and Mining industries.

UNDERSTAND THE NQF LADDER

South Africa's National Qualifications Framework (NQF) structures all education from Level 1 to 10.

PHASE 2: FROM CLASSROOM TO CAREER

CHOOSE A LEARNING PATHWAY

Pursue university degrees, TVET College diplomas, or formal apprenticeships.

SECURE WORKPLACE EXPERIENCE

Learnerships and internships are critical for developing hands-on, practical skills.

QUALIFY VIA TRADE TEST

A final trade test certifies you as a qualified artisan in your chosen field.

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Building a Technical Career:
From Theory to Certified Practice
Career & Qualification Pathways
Core Technical Competencies
Mastery of Electrical & Engineering Principles
Spanning AC/DC circuits, machine theory, power systems, and industrial electronics.
Integration of Modern Technologies
Proficiency in AI, IoT, Smart Grids, and automation systems like PLC and SCADA.
Foundation in Workshop Safety & Maintenance
Adherence to safety protocols, including first aid, fire prevention, and the 5S system.
Structured Education Path
Progressing through the National Qualification Framework (NQF) from certificates to diplomas.
Workplace-Integrated Learning
Gaining experience via learnerships, apprenticeships, and building a Portfolio of Evidence (PoE).
Achieving Professional Recognition
Undergoing trade tests and validation by national bodies for formal certification.
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Building Your Future: A Roadmap to a Technical Career in South Africa

Phase 1: Discover Your Path

Start with Self-Assessment

Use psychometric tests to match your personal interests to a technical career path.

Explore High-Demand Sectors

Research careers in Engineering (MERSETA), Chemical (CHIETA), and Mining (MQA) industries.

Understand the NQF Ladder

South Africa's National Qualifications Framework (NQF) structures all education from Level 1 to 10.

Phase 2: From Classroom to Career

Choose a Learning Pathway

Pursue university degrees, TVET College diplomas (N1-N6), or formal apprenticeships.

Secure Workplace Experience

Learnerships and internships are critical for developing hands-on, practical skills.

Qualify via Trade Test

A final trade test certifies you as a qualified artisan in your chosen field.

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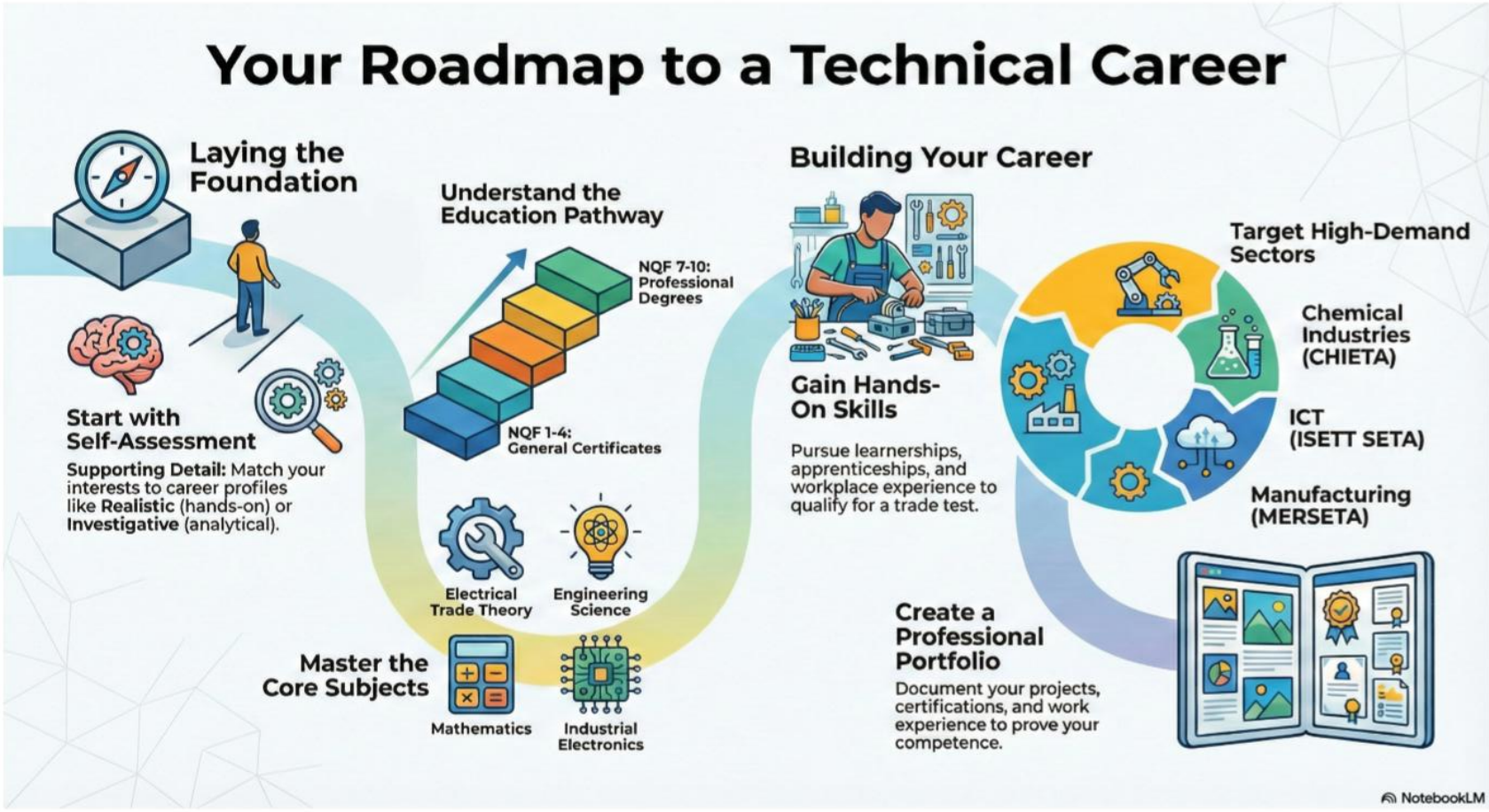
Your Roadmap to a Technical Career
Laying the Foundation
Start with Self-Assessment
Supporting Detail: Match your interests to career profiles like Realistic (hands-on) or Investigative (analytical).
Understand the Education Pathway
NQF 7-10: Professional Degrees
NQF 1-4: General Certificates
Master the Core Subjects
Electrical Trade Theory
Engineering Science
Mathematics
Industrial Electronics
Building Your Career
Gain Hands-On Skills
Pursue learnerships, apprenticeships, and workplace experience to qualify for a trade test.
Target High-Demand Sectors
Chemical Industries (CHIETA)
ICT (ISETT SETA)
Manufacturing (MERSETA)
Create a Professional Portfolio
Document your projects, certifications, and work experience to prove your competence.
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A Portfolio of Persistence

An Evidence-Based Case Study of One Individual's Pursuit of Professional Recognition

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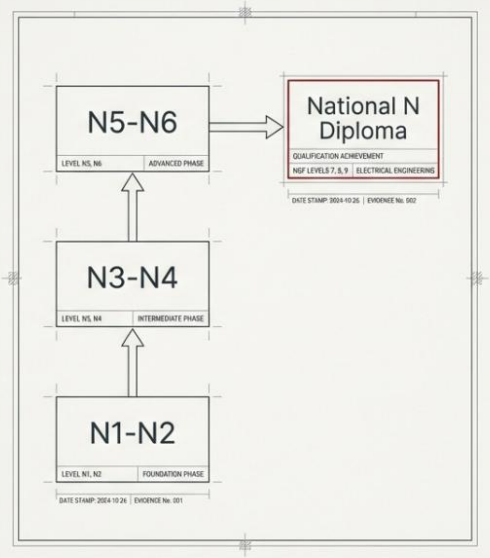
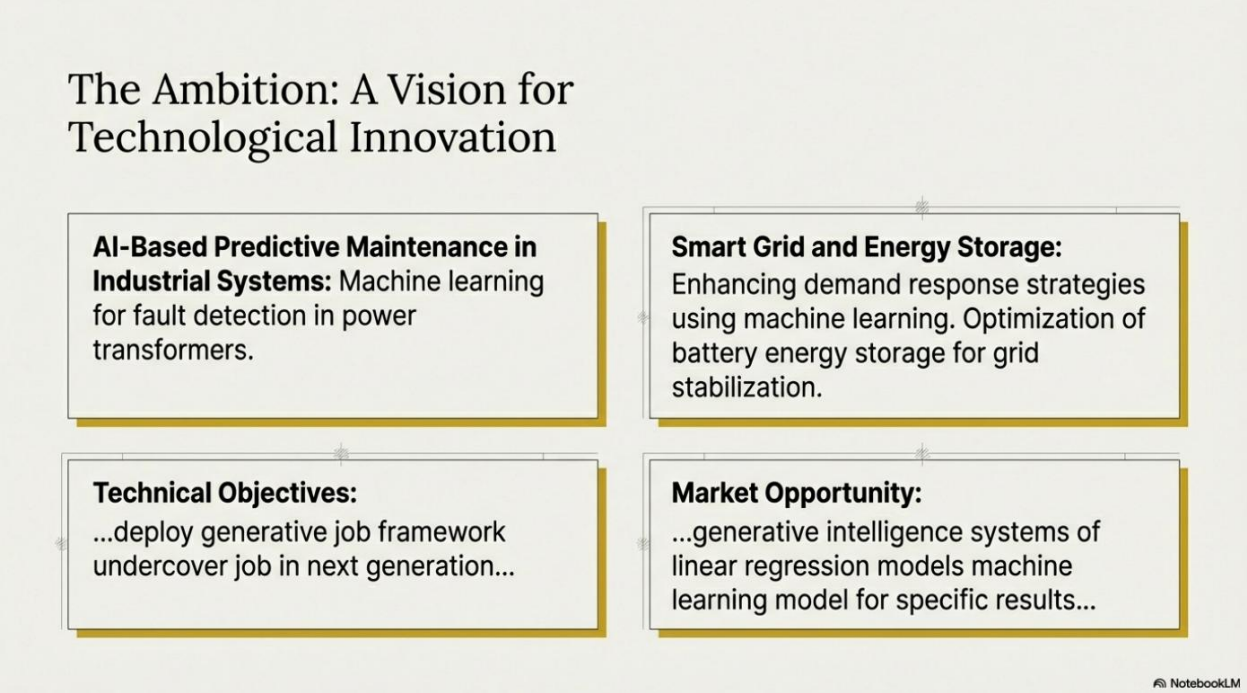
The Formal Path: The Pursuit of a National N Diploma

This section details the intended educational journey of Tshingombe Tshitadi.

- Objective: To achieve a National N Diploma (NQF Levels 7, 8, 9) in Electrical Engineering.
- Institution: St Peace College (among others).
- Curriculum: A comprehensive program spanning multiple levels (N1-N6).
- Key Subjects Listed: Electrical Trade Theory (N1, N3), Industrial Electronics (N1, N3, N4), Mathematics (N1, N2, N4), Engineering Science (N3), Electro-technology (N3, N4)



NotebookLM


The Ambition: A Vision for Technological Innovation
AI-Based Predictive Maintenance in Industrial Systems: Machine learning for fault detection in power transformers.
Smart Grid and Energy Storage: Enhancing demand response strategies using machine learning. Optimization of battery energy storage for grid stabilization.
Technical Objectives: ...deploy generative job framework undercover job in next generation...
Market Opportunity: ...generative intelligence systems of linear regression models machine learning model for specific results...
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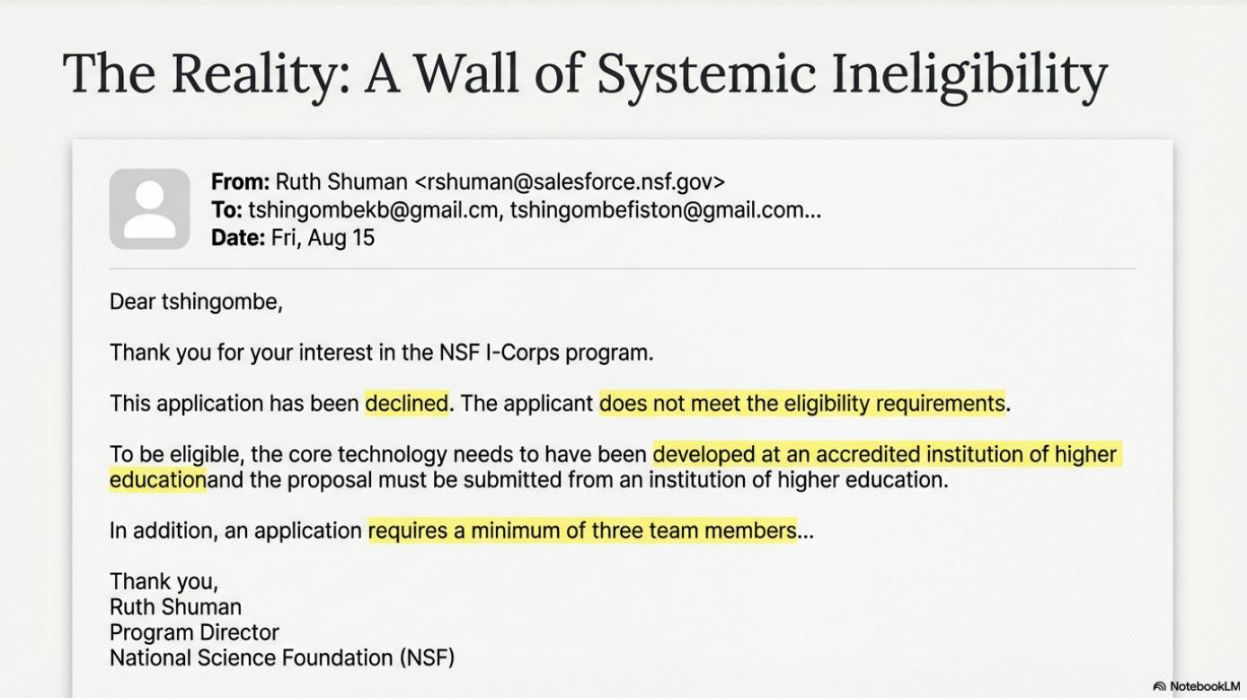
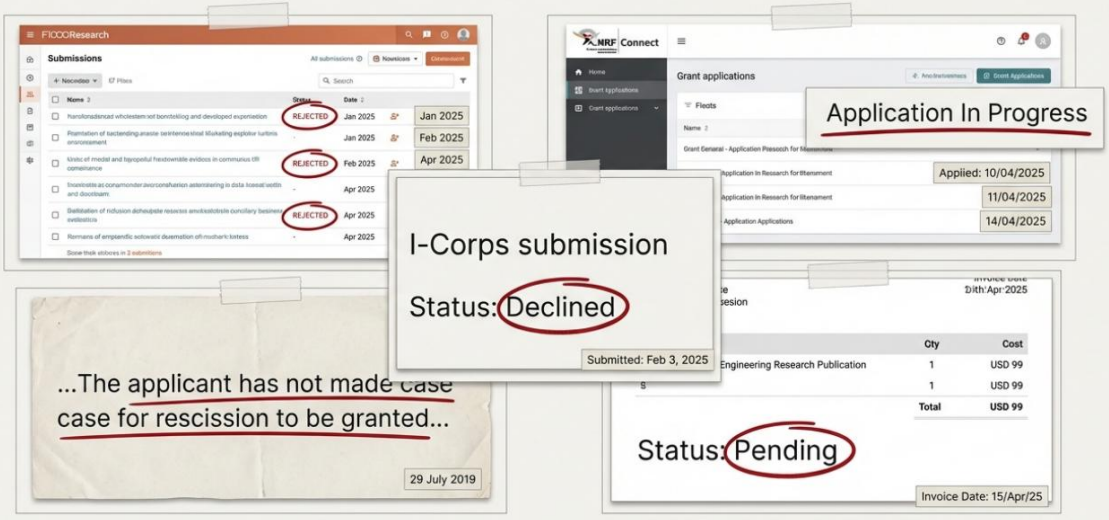

The Reality: A Wall of Systemic Ineligibility
From: Ruth Shuman <rshuman@salesforce.nsf.gov>
To: tshingombekb@gmail.cm, tshingombefiston@gmail.com...
Date: Fri, Aug 15
Dear tshingombe,
Thank you for your interest in the NSF I-Corps program.
This application has been declined. The applicant does not meet the eligibility requirements.
To be eligible, the core technology needs to have been developed at an accredited institution of higher educationand the proposal must be submitted from an institution of higher education.
In addition, an application requires a minimum of three team members...
Thank you,
Ruth Shuman
Program Director
National Science Foundation (NSF)
NotebookLM

An Archive of Obstacles



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The Language of the Labyrinth: "Irregularity"

Excerpt 1 (From a letter to the Minister of DHET): [redacted]

"I m appear to your department goverment institution for allegation view **no result of statement ID** candidate Engineering... NQF 7,8,9,19,, saqa outcome irregularity final, N5,n6, examination national **was not delivery in the time** external assessessment **commited iirregularities**..aware... **invalidated subject n3 trade theory electrical transcript**..."

Excerpt 2 (From a complaint to the Inspector-General of Intelligence): [redacted]

"Re: your complaint pertaining to allegations of **deleted college record from your college database**"

Excerpt 3 (From SAQA inquiry): [redacted]

"saqa accept only schools leaving qualifications issued by the official examine certification body in the country of original and not by the school..."

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The Digital Pivot: Forging a New Path to Validation

When formal channels became a labyrinth of unresolved issues, a strategic shift occurred. Tshitadi turned to global, open-access platforms to continue his education and build a new, verifiable portfolio of work.

For publishing and archiving a vast library of technical research and documentation.

For engaging with the global coding community and version-controlling projects.

For acquiring certified skills and diplomas from a global online learning platform.

For structured learning paths in cutting-edge technologies like data analytics and cloud computing.

New Path Initiated: 2020

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Creating a Public Record of Expertise

- Electrical Trade Theory Engineering Nated (Sep 9, 2023)
- Doc 12 Design Analyse Investigate Engineering Tshingombe (archived Jul 22, 2025)
- analyse investigation enginering (Submitted: 15 Aug 2025)
- project engineering Career Discovery and Mentoring Framework... (Submitted: 15 Aug 2025)
- engineering Research cvs build curriculum project job course... (Submitted: 15 Aug 2025)
- engineering Analyst Engineering (Submitted: 15 Aug 2025)
- Electrical Trade Tried enginering (Submitted: 15 Aug 2025)
- Doc 12 Design Analyse Investigateering (Submitted: 15 Aug 2025)
- project eineering Career Discovery and Mentoring Framework... (Submitted: 15 Aug 2025)
- building engineering · career Discovery and Mentoring ... (Submitted: 15 Aug 2025)
- engineering Research cvs build curriculum project b·coulls... (Submitted: 15 Aug 2025)
- engineering Research cvs build curriculum project job course... (Submitted: 15 Aug 2025)
- engineering Trade Enginering (Submitted: 15 Aug 2025)
- engineering brockyrer. Tarad (Submitted: 15 Aug 2025)
- engineering Research Investiating (Submitted: 15 Aug 2025)

Archived & Publicly Accessible

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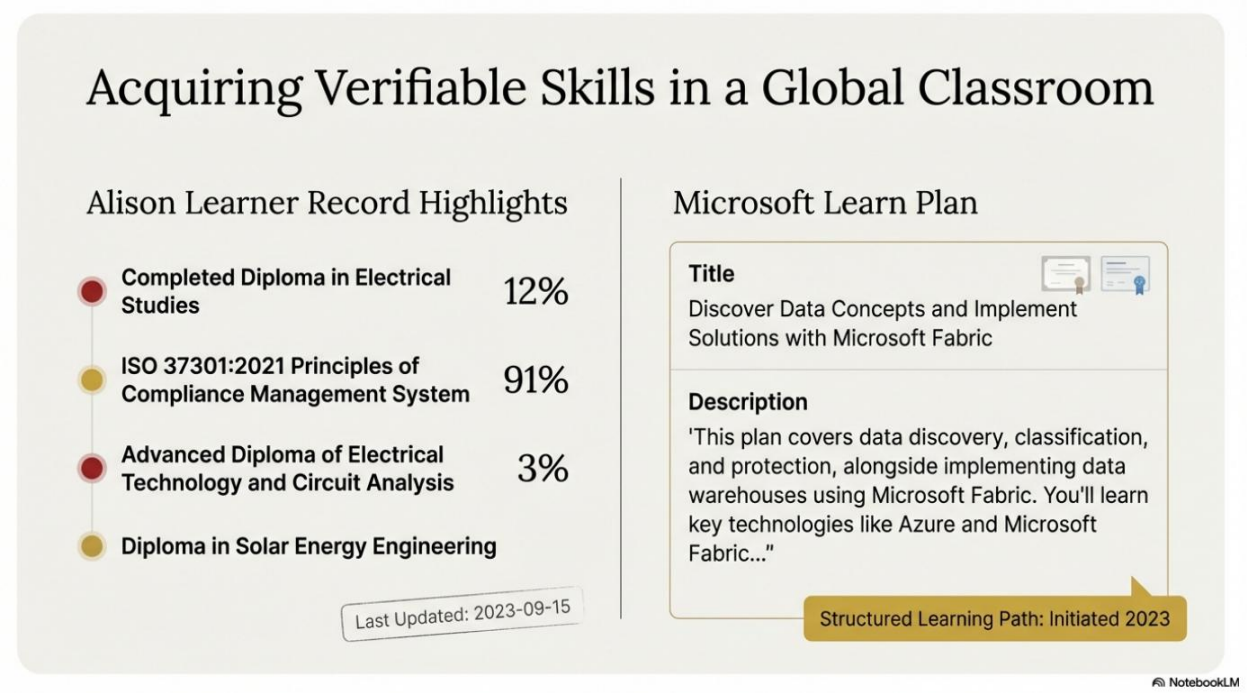
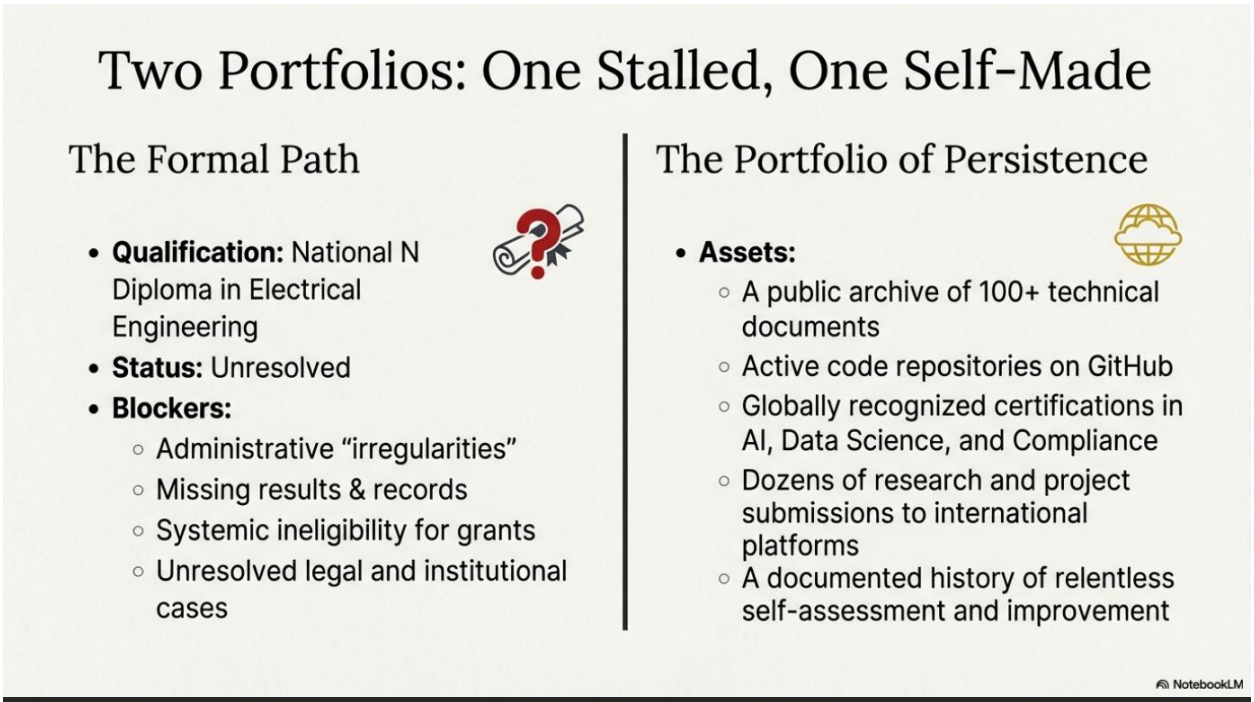

Acquiring Verifiable Skills in a Global Classroom
Alison Learner Record Highlights
Completed Diploma in Electrical Studies
12%
ISO 37301:2021 Principles of Compliance Management System
91%
Advanced Diploma of Electrical Technology and Circuit Analysis
3%
Diploma in Solar Energy Engineering
Last Updated: 2023-09-15
Microsoft Learn Plan
Title
Discover Data Concepts and Implement Solutions with Microsoft Fabric
Description
'This plan covers data discovery, classification, and protection, alongside implementing data warehouses using Microsoft Fabric. You'll learn key technologies like Azure and Microsoft Fabric..."
Structured Learning Path: Initiated 2023
NotebookLM

Self-Assessment Against a Global Baseline
Alison Aptitude & Reasoning Tests
Verbal Reasoning Score: You scored better than 6% of global test-takers.
"This baseline is a strong starting point for growth!"
Workplace Personality Assessment Results
Assertiveness: 9/10
Stress Management: 3/10
Work Structure: 1/10
Recommended Courses
Stress Management Skills for Life, Kaizen Approach - Lean Methodology
NotebookLM


Two Portfolios: One Stalled, One Self-Made
The Formal Path
• Qualification: National N Diploma in Electrical Engineering
• Status: Unresolved
• Blockers:
◦ Administrative "irregularities"
◦ Missing results & records
◦ Systemic ineligibility for grants
◦ Unresolved legal and institutional cases
The Portfolio of Persistence
• Assets:
◦ A public archive of 100+ technical documents
◦ Active code repositories on GitHub
◦ Globally recognized certifications in AI, Data Science, and Compliance
◦ Dozens of research and project submissions to international platforms
◦ A documented history of relentless self-assessment and improvement
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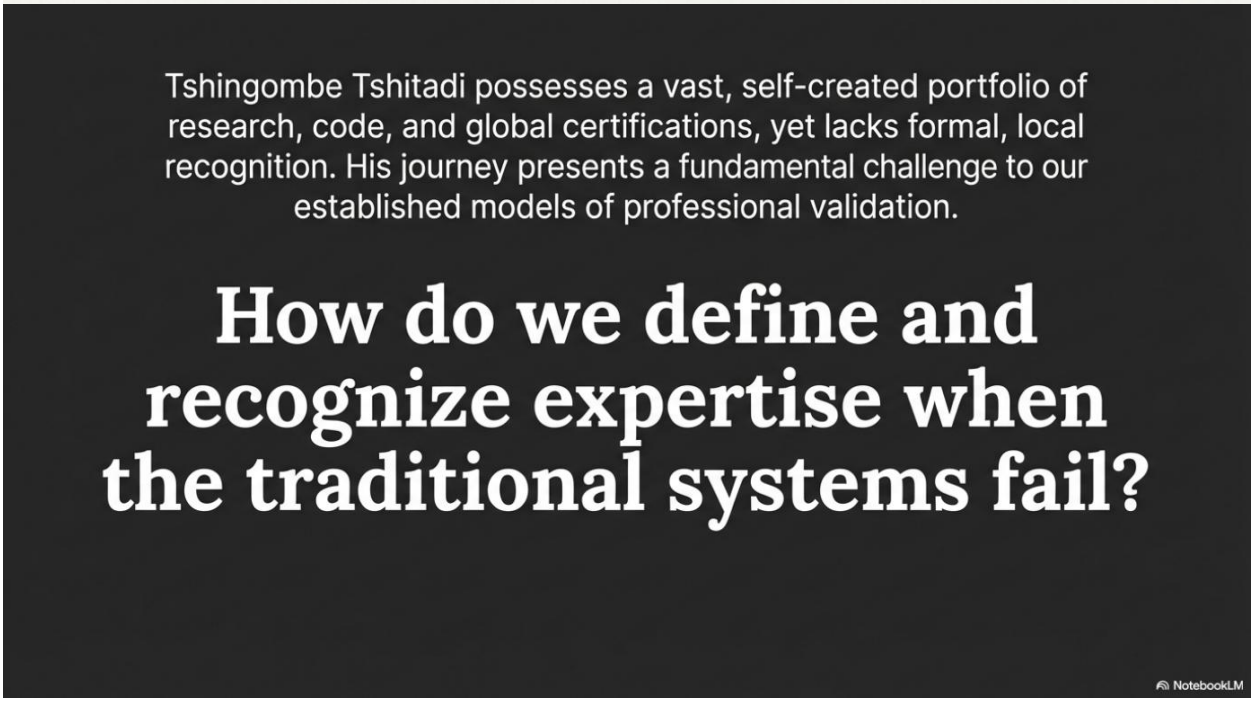
Tshingombe Tshitadi possesses a vast, self-created portfolio of research, code, and global certifications, yet lacks formal, local recognition. His journey presents a fundamental challenge to our established models of professional validation.
How do we define and recognize expertise when the traditional systems fail?
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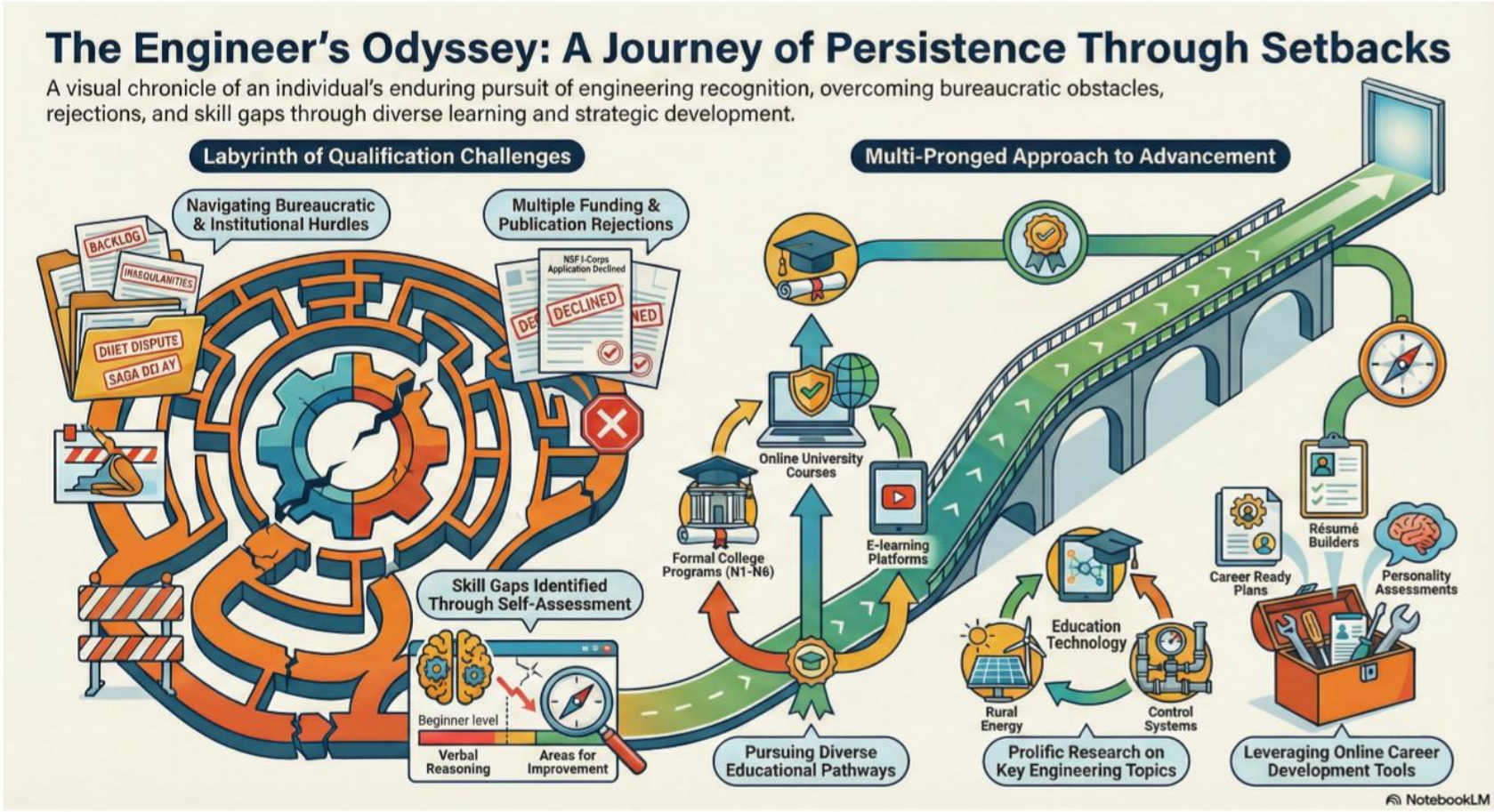
The Engineer's Odyssey: A Journey of Persistence Through Setbacks
A visual chronicle of an individual's enduring pursuit of engineering recognition, overcoming bureaucratic obstacles, rejections, and skill gaps through diverse learning and strategic development.
Labyrinth of Qualification Challenges
Navigating Bureaucratic & Institutional Hurdles
Multiple Funding & Publication Rejections
BACKLOG
INABSOULANITIES
DIIET DISPUTE
SAGA DDJ AY
NSF I-Corps Application Declined
DECLINED
Skill Gaps Identified Through Self-Assessment
Beginner level
Verbal Reasoning
Areas for Improvement
Multi-Pronged Approach to Advancement
Online University Courses
Formal College Programs (N1-N6)
E-learning Platforms
Pursuing Diverse Educational Pathways
Education Technology
Rural Energy
Control Systems
Prolific Research on Key Engineering Topics
Résumé Builders
Career Ready Plans
Personality Assessments
Leveraging Online Career Development Tools
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Engineering the Convergence of Physical Infrastructure and Digital Intelligence

A portfolio of evidence demonstrating interdisciplinary mastery for the complex challenges of the 21st century.

Name: **Tshingombe Tshitadi Fiston**

A curated exploration of a deliberately engineered skillset, built to operate at the intersection of power systems, software architecture, cybersecurity, and future technologies.

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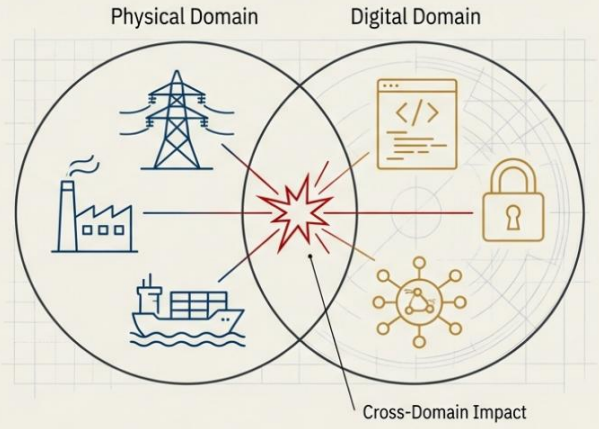
The Modern Challenge: Interconnected Systems, Interwoven Risks

Today's critical infrastructure—from energy grids and manufacturing to logistics and finance—is no longer purely physical or digital. It is a complex hybrid system.

- **Physical Vulnerabilities** now have digital consequences.
- **Digital Threats** can cripple physical operations.
- **Efficiency and Intelligence** demand a deep, integrated understanding of both domains.

This new reality requires a new type of architect: a visionary problem-solver who can design, build, and secure these cyber-physical systems.



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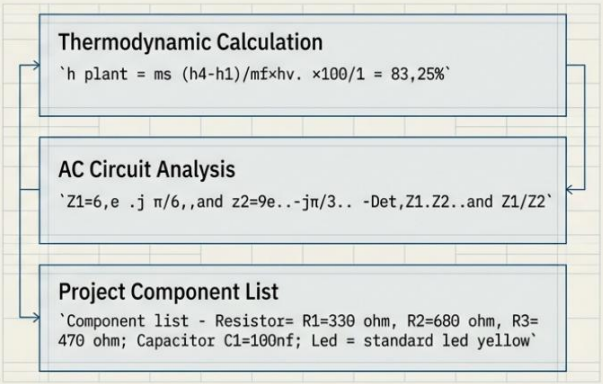
Pillar I: Foundational Mastery in Electrical Engineering

Architecting the physical backbone of modern infrastructure with a focus on power, resilience, and sustainability.

Key Areas of Study

- **Doctorate-Level Focus:** Specialist Engineering in Infrastructure, Advanced Power System Analysis, Smart Grids & IoT Applications, High Voltage Engineering.
- **System Design:** Sustainable Electrical Practices, Renewable Energy Systems (Solar, Wind, Bioenergy), Electrical Infrastructure Design and Management.
- **Component-Level Projects:** Design and construction of circuits including PIR-triggered main switches, light sensors with twilight detection, and mains power outage monitors.

Visual Evidence - The Engineer's Notebook (Sample)


Thermodynamic Calculation
`h plant = ms (h4-h1)/mf×hv. ×100/1 = 83,25%`
AC Circuit Analysis
`Z1=6,e .j π/6,,and z2=9e..-jπ/3.. -Det,Z1.Z2..and Z1/Z2`
Project Component List
`Component list - Resistor= R1=330 ohm, R2=680 ohm, R3= 470 ohm; Capacitor C1=100nf; Led = standard led yellow`

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Pillar II: Weaving Digital Intelligence into the Core

Leveraging AI, Machine Learning, and advanced data analytics to create responsive, optimized, and predictive systems.

Validated Skills & Training Microsoft

- Building next-generation apps with Azure OpenAI Service.
- Implementing Retrieval Augmented Generation (RAG).
- Creating Azure AI Search solutions and custom skills.
- Training and evaluating deep learning, regression, and classification models.

Conceptual Application

- Applying Machine Learning in Cyber-Physical Systems (CPS) for anomaly detection and performance optimization.
- Developing AI-powered product recommendations for B2B transactions in the electric power sector, leveraging collaborative filtering and fused behavioral data.

Using Python for data collection from electric meters via APIs:

```
def collect_meter_data(meter_id):
    response = requests.get(f"http://api.electricity.meter.com/{meter_id}")
```

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Pillar III: Fortifying Systems with Advanced Security & DLT

Building resilient and trustworthy infrastructure through modern cybersecurity principles and immutable ledger technology.

Core Competencies

- **Cybersecurity:** Threat & vulnerability analysis in digital libraries and CPS, implementing security policies, network security essentials, and incident response/recovery.
- **Distributed Ledger Technology (DLT):** Blockchain for secure credentialing, smart contracts in educational/financial transactions, and ensuring data privacy and security in DLT systems.
- **Web & Data Security:** Designing immutable data storage solutions for web applications, understanding state management with immutable data, and leveraging GraphQL for secure data transfer.

Visual Snippet - Certificate Authority Detail

Certificate Details

```
Signature algorithm: sHS - 256ECDsa
Purpose : digital signature
          key server authentication
```

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Pillar IV: Engineering the Next Frontier of Technology

Proactively acquiring expertise in emerging fields to solve the intractable problems of tomorrow.

Quantum Computing in Systems Engineering

Exploring quantum algorithms, gates, circuits, and programming languages to address complex optimization challenges in large-scale systems.

Autonomous Systems & Electric Vehicles

Integrating machine learning, sensor technologies, and renewable energy for advanced autonomous vehicles and drones.

Synthetic Biology & Genetic Engineering

Understanding fundamentals of genetic engineering (including CRISPR), biopharmaceutical manufacturing, and applications in vertical farming and urban agriculture.

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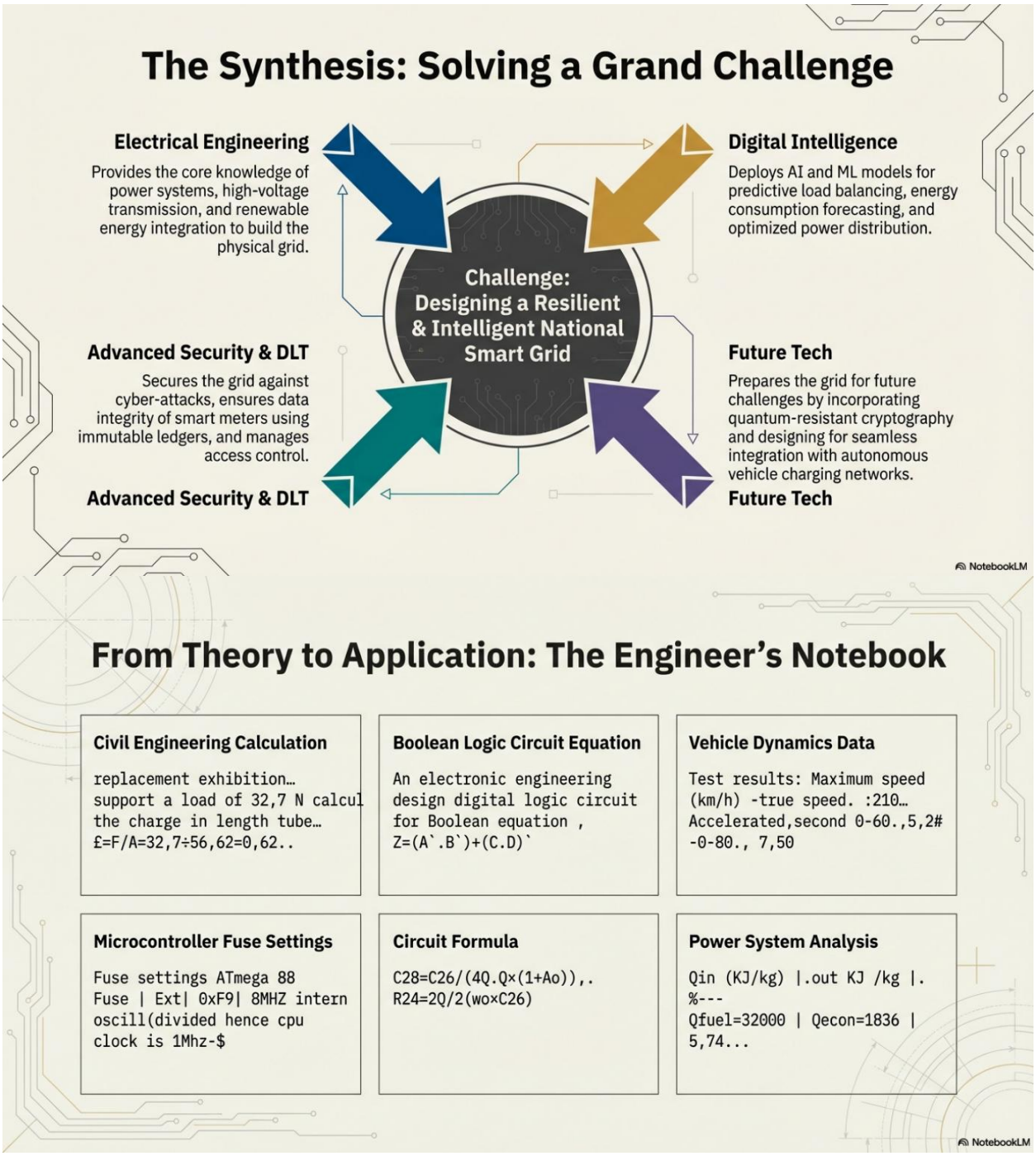
The Synthesis: Solving a Grand Challenge
Electrical Engineering
Provides the core knowledge of power systems, high-voltage transmission, and renewable energy integration to build the physical grid.
Digital Intelligence
Deploys AI and ML models for predictive load balancing, energy consumption forecasting, and optimized power distribution.
Challenge: Designing a Resilient & Intelligent National Smart Grid
Advanced Security & DLT
Secures the grid against cyber-attacks, ensures data integrity of smart meters using immutable ledgers, and manages access control.
Future Tech
Prepares the grid for future challenges by incorporating quantum-resistant cryptography and designing for seamless integration with autonomous vehicle charging networks.
Advanced Security & DLT
Future Tech
NotebookLM
From Theory to Application: The Engineer's Notebook
Civil Engineering Calculation
replacement exhibition… support a load of 32,7 N calcul the charge in length tube… £=F/A=32,7÷56,62=0,62..
Boolean Logic Circuit Equation
An electronic engineering design digital logic circuit for Boolean equation , Z=(A`.B`)+(C.D)`
Vehicle Dynamics Data
Test results: Maximum speed (km/h) -true speed. :210… Accelerated,second 0-60.,5,2# -0-80., 7,50
Microcontroller Fuse Settings
Fuse settings ATmega 88 Fuse | Ext| 0xF9| 8MHZ intern oscill(divided hence cpu clock is 1Mhz-$
Circuit Formula
C28=C26/(4Q.Q×(1+Ao)),. R24=2Q/2(wo×C26)
Power System Analysis
Qin (KJ/kg) |.out KJ /kg |. %--- Qfuel=32000 | Qecon=1836 | 5,74...
NotebookLM

The Persistent Search for a Worthy Challenge

A highly specialized, interdisciplinary skill set requires a uniquely challenging role. The journey has involved a deliberate and targeted search across critical sectors, **seeking an organization with the vision to leverage a true systems-thinking approach.**

Critical Infrastructure & Energy
Eskom
City Power

Finance & Governance
South African Reserve Bank (SARB)

Technology & AI
Microsoft
Salesforce

Security & Policing
Metropolitan Police
ISC²

Industrial & Automotive
Ford
Eaton
Schneider Electric

"This was not a search for any job, but a search for the right problem to solve."

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An Invitation to Build the Future

The evidence presented outlines a unique and deliberate convergence of expertise. This portfolio is not a static record of past learning, but a toolkit ready for deployment against the most complex cyber-physical challenges.

I am seeking to apply this integrated knowledge of **Electrical Infrastructure**, **Digital Intelligence**, and **Advanced Security** to a mission-critical role that demands not just a specialist, but a systems architect.

Let's build resilient, intelligent, and secure systems together.

Tshingombe Tshitadi Fiston | tshingombefiston@gmail.com

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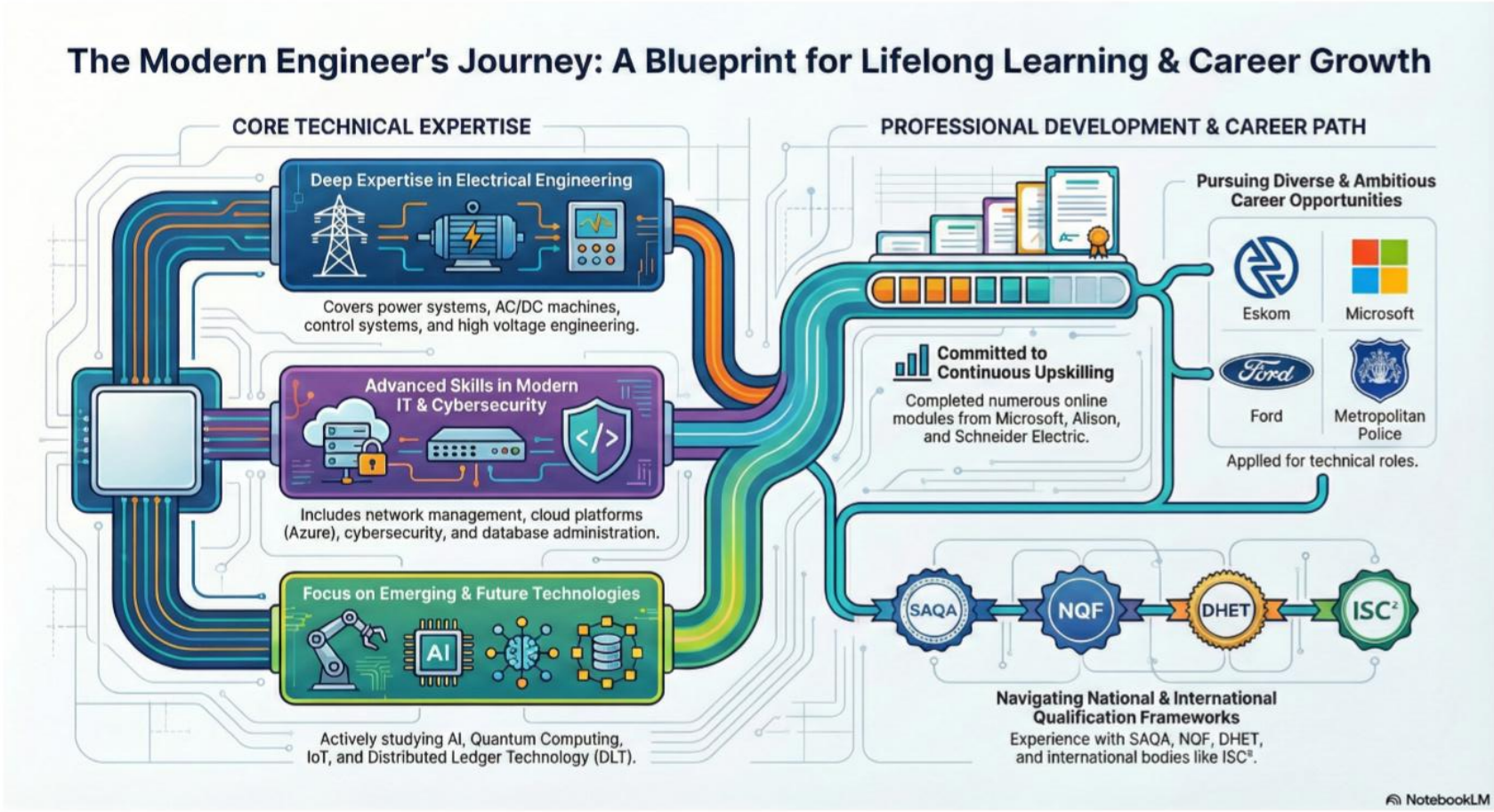
The Modern Engineer's Journey: A Blueprint for Lifelong Learning & Career Growth
CORE TECHNICAL EXPERTISE
Deep Expertise in Electrical Engineering
Covers power systems, AC/DC machines, control systems, and high voltage engineering.
Advanced Skills in Modern IT & Cybersecurity
Includes network management, cloud platforms (Azure), cybersecurity, and database administration.
Focus on Emerging & Future Technologies
AI
Actively studying AI, Quantum Computing, IoT, and Distributed Ledger Technology (DLT).
PROFESSIONAL DEVELOPMENT & CAREER PATH
Committed to Continuous Upskilling
Completed numerous online modules from Microsoft, Alison, and Schneider Electric.
Pursuing Diverse & Ambitious Career Opportunities
Eskom
Microsoft
Ford
Ford
Metropolitan Police
Applied for technical roles.
SAQA
NQF
DHET
ISC²
Navigating National & International Qualification Frameworks
Experience with SAQA, NQF, DHET, and international bodies like ISC².
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Re-Architecting Technical Education

A Blueprint for a Resilient, Verifiable, and World-Class Engineering Workforce in South Africa.

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THE CORE CONFLICT: A SYSTEM AT ODDS WITH ITSELF

THE TECHNICAL DEMAND

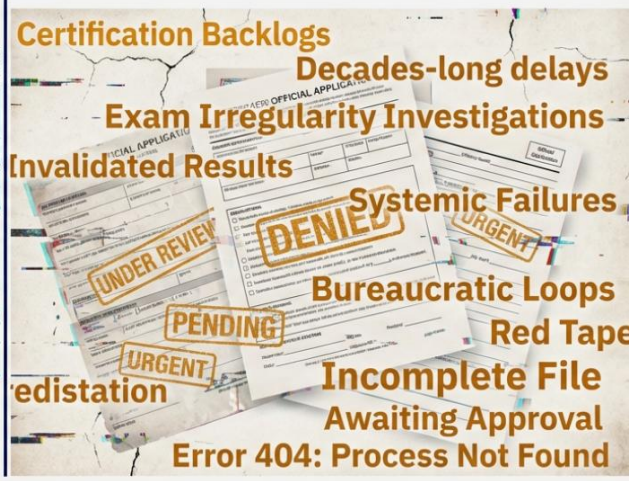
$$E = -\frac{d\Phi}{dt}$$

'Faraday's Law'

$$W = \int V dQ$$

'Capacitor Energy'

THE ADMINISTRATIVE DRAG



Success requires not only technical mastery but the resilience to overcome bureaucratic chaos.

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THREE COUNTER-INTUITIVE LESSONS FROM THE DIGITAL PAPER TRAIL
1
TECHNICAL IS THE NEW THEORETICAL
Modern vocational engineering is not "low-skilled." NATED modules like Electrotechnics N4 and Industrial Electronics N6 require calculus, integrals, and advanced physics. Hands-on work is inseparable from theoretical mastery.
2
DENIED
PENDING
PENDING
THE REAL FINAL BOSS IS BUREAUCRACY
Administrative hurdles from SAQA, DHET, and QCTO often overshadow technical challenges. Systemic failures in certification and exam administration are the biggest obstacles to qualification.
3
SPECIALIZATION IS FOR INSECTS
True experts are polymaths. The modern engineer must blend electrical engineering with education policy, law, AI, and compliance. Cross-disciplinary thinking is the key to solving complex problems.
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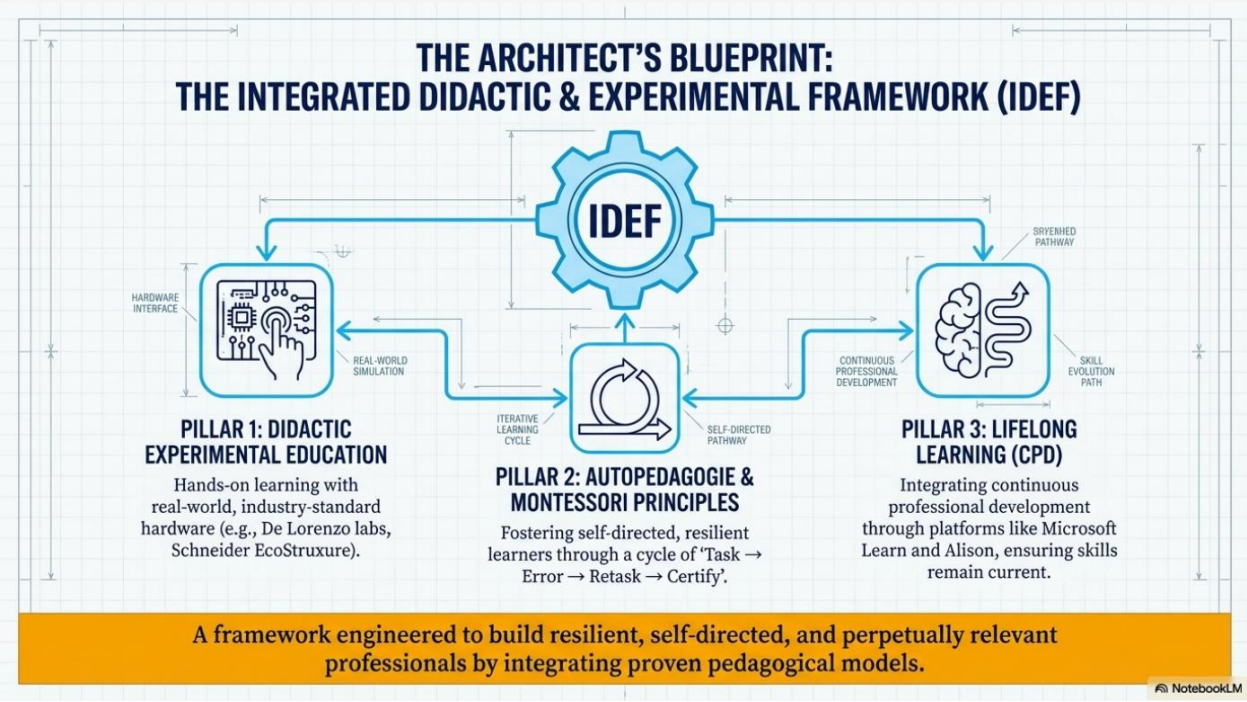
THE ARCHITECT'S BLUEPRINT:
THE INTEGRATED DIDACTIC & EXPERIMENTAL FRAMEWORK (IDEF)
IDEF
HARDWARE INTERFACE
REAL-WORLD SIMULATION
ITERATIVE LEARNING CYCLE
SELF-DIRECTED PATHWAY
CONTINUOUS PROFESSIONAL DEVELOPMENT
SKILL EVOLUTION PATH
SRYENHED PATHWAY
PILLAR 1: DIDACTIC EXPERIMENTAL EDUCATION
Hands-on learning with real-world, industry-standard hardware (e.g., De Lorenzo labs, Schneider EcoStruxure).
PILLAR 2: AUTOPEDAGOGIE & MONTESSORI PRINCIPLES
Fostering self-directed, resilient learners through a cycle of 'Task → Error → Retask → Certify'.
PILLAR 3: LIFELONG LEARNING (CPD)
Integrating continuous professional development through platforms like Microsoft Learn and Alison, ensuring skills remain current.
A framework engineered to build resilient, self-directed, and perpetually relevant professionals by integrating proven pedagogical models.
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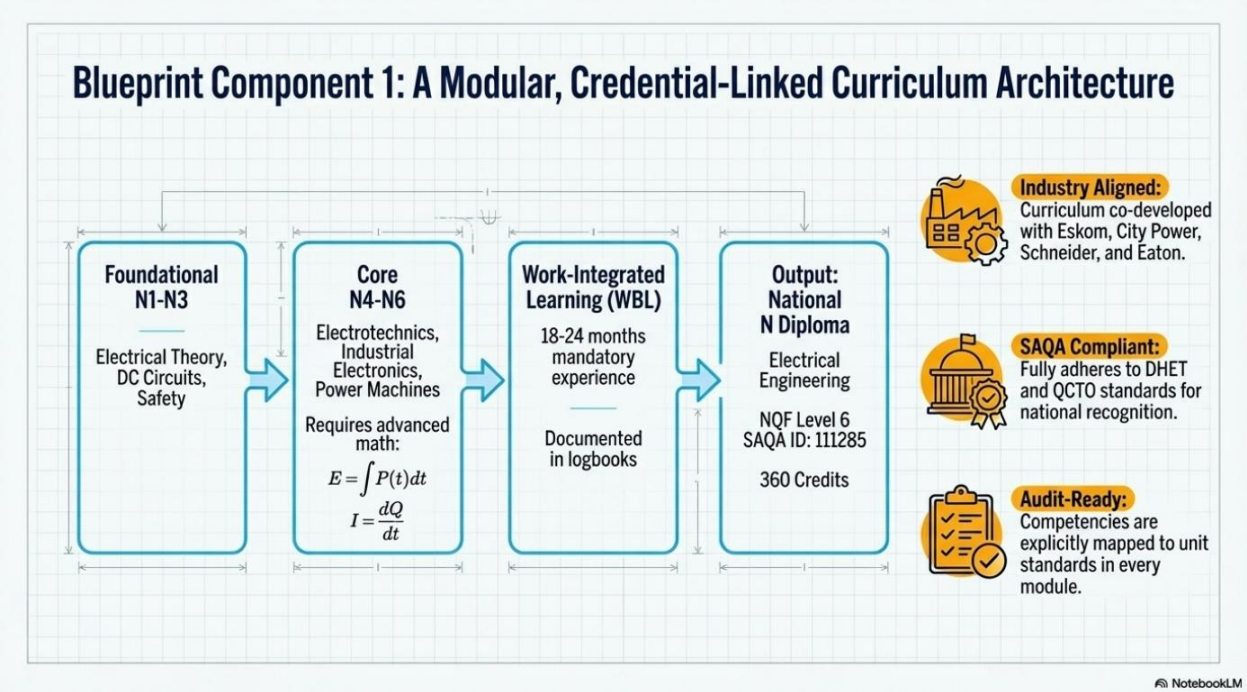
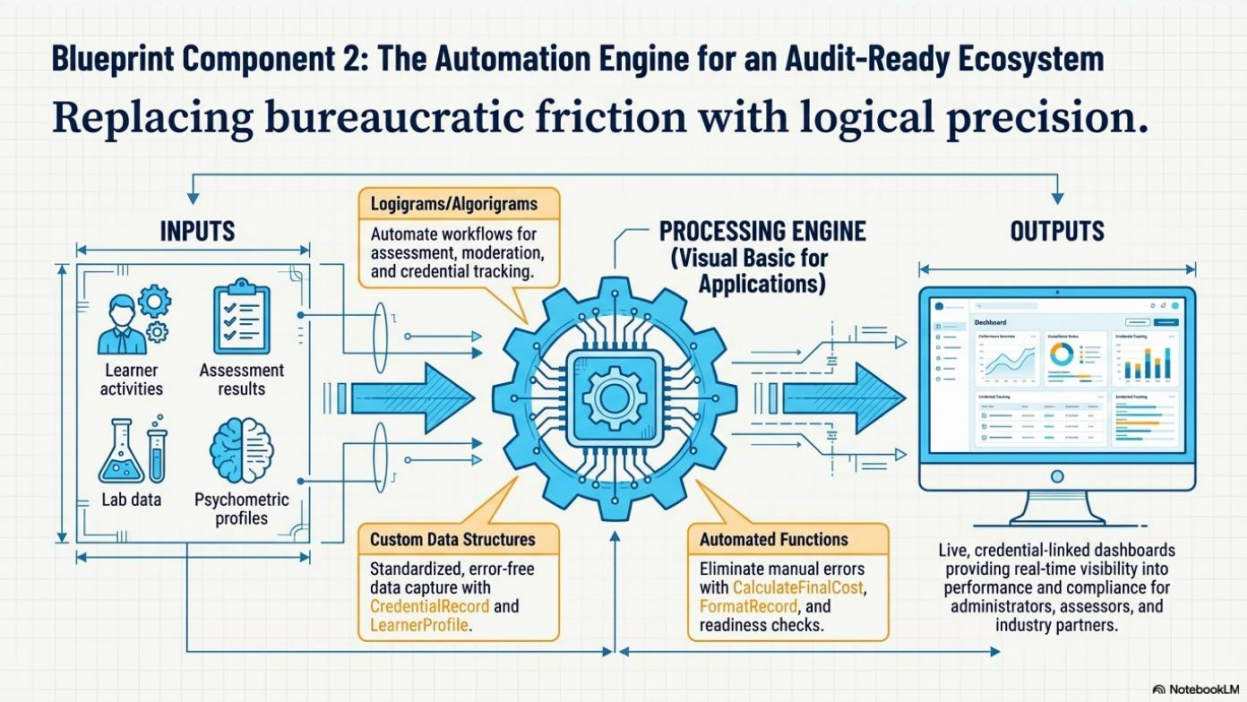
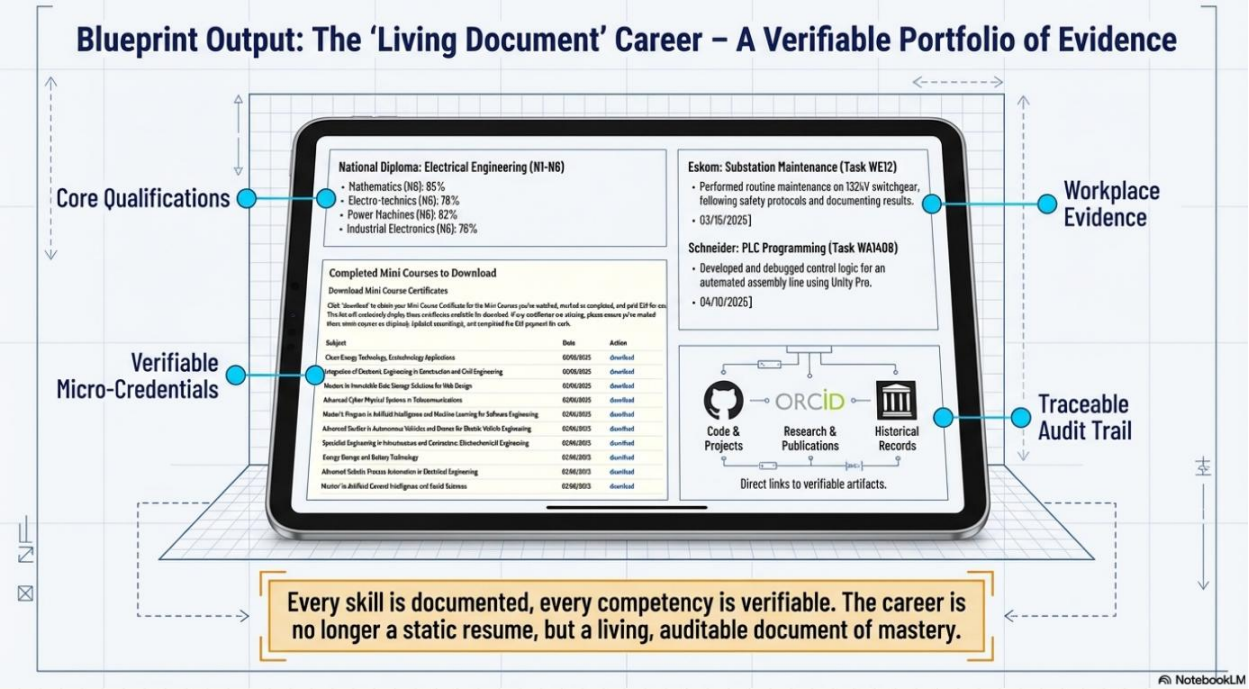
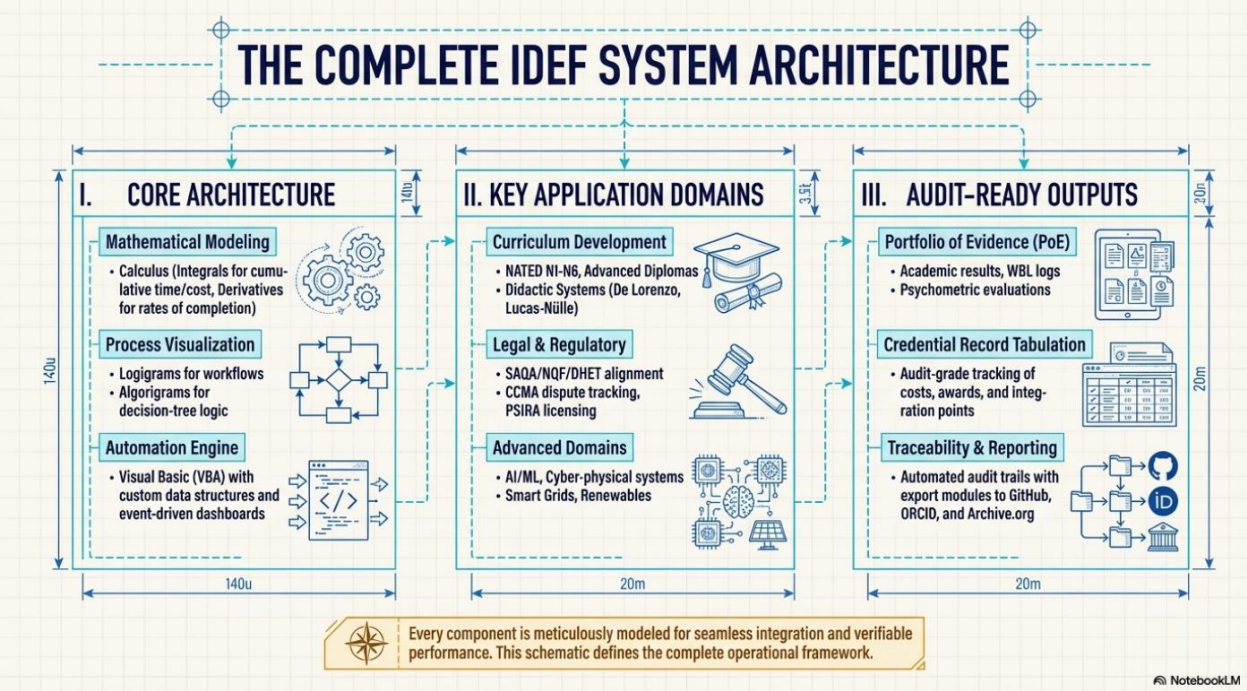
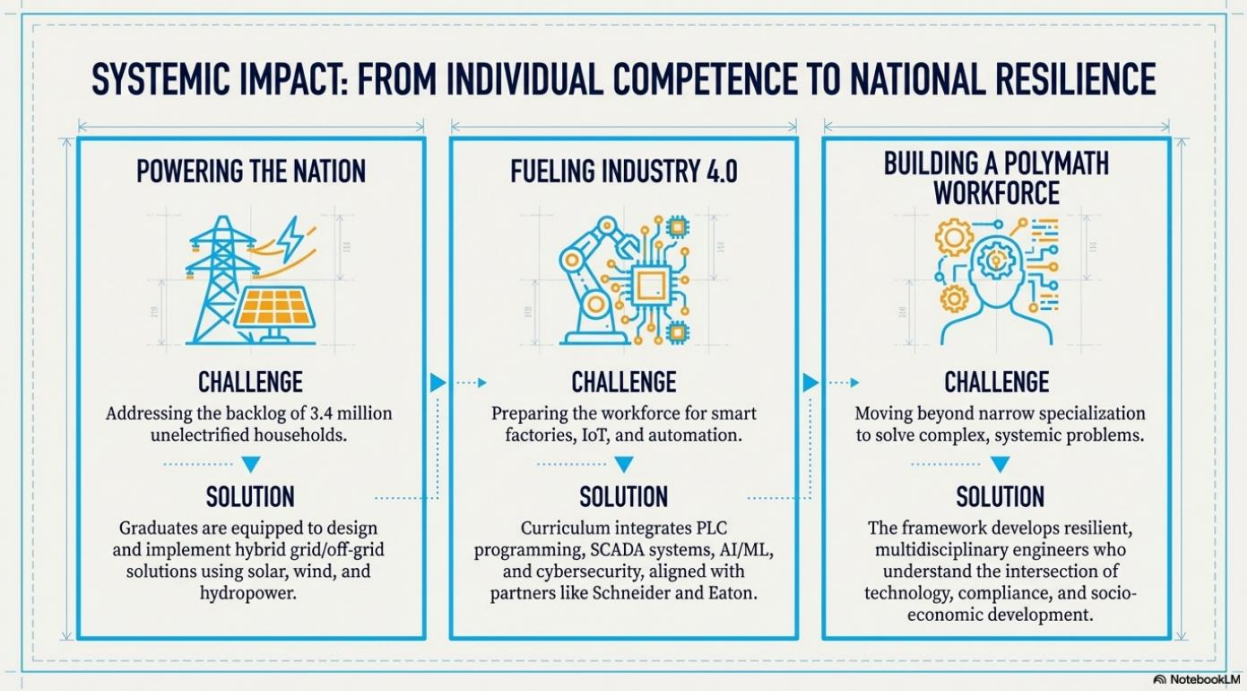
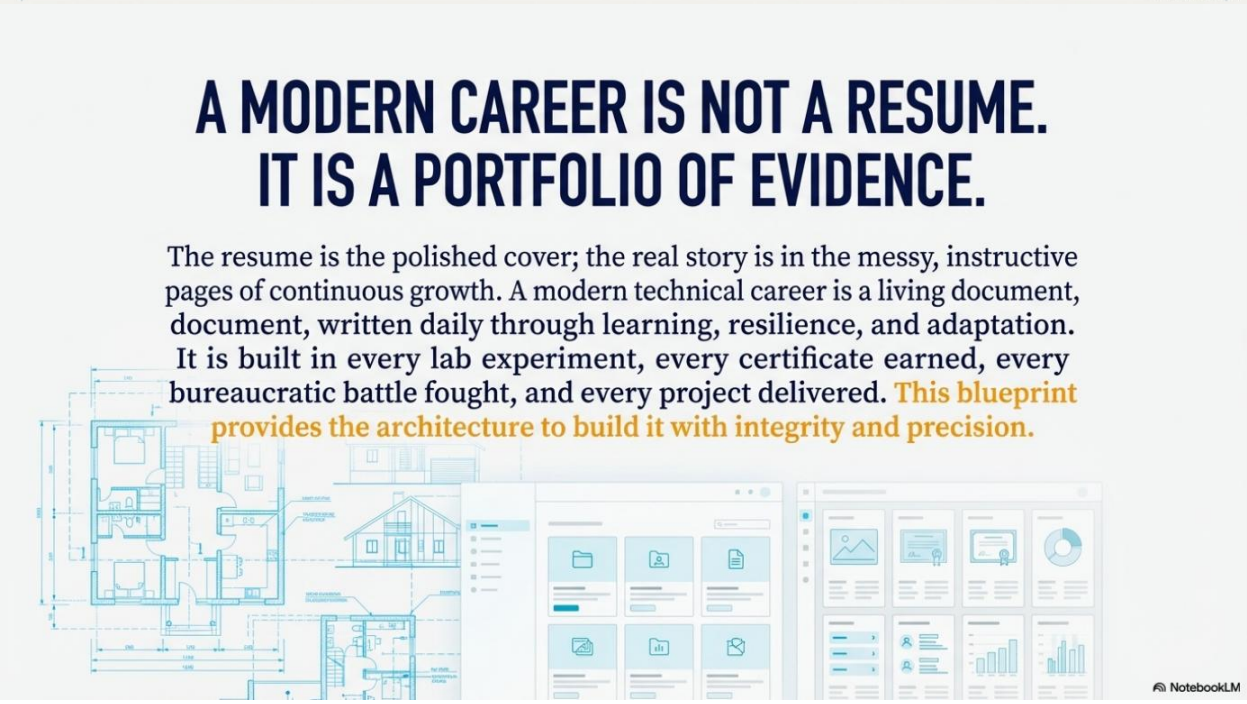

Blueprint Component 1: A Modular, Credential-Linked Curriculum Architecture
Foundational N1-N3
Electrical Theory, DC Circuits, Safety
Core N4-N6
Electrotechnics, Industrial Electronics, Power Machines
Requires advanced math:
$E = \int P(t)dt$
$I = \frac{dQ}{dt}$
Work-Integrated Learning (WBL)
18-24 months mandatory experience
Documented in logbooks
Output: National N Diploma
Electrical Engineering
NQF Level 6
SAQA ID: 111285
360 Credits
Industry Aligned:
Curriculum co-developed with Eskom, City Power, Schneider, and Eaton.
SAQA Compliant:
Fully adheres to DHET and QCTO standards for national recognition.
Audit-Ready:
Competencies are explicitly mapped to unit standards in every module.
NotebookLM


Blueprint Component 2: The Automation Engine for an Audit-Ready Ecosystem
Replacing bureaucratic friction with logical precision.
INPUTS
Learner activities
Assessment results
Lab data
Psychometric profiles
Logigrams/Algorigrams
Automate workflows for assessment, moderation, and credential tracking.
PROCESSING ENGINE (Visual Basic for Applications)
OUTPUTS
Custom Data Structures
Standardized, error-free data capture with CredentialRecord and LearnerProfile.
Automated Functions
Eliminate manual errors with CalculateFinalCost, FormatRecord, and readiness checks.
Live, credential-linked dashboards providing real-time visibility into performance and compliance for administrators, assessors, and industry partners.
NotebookLM


Blueprint Output: The 'Living Document' Career – A Verifiable Portfolio of Evidence
Core Qualifications
Verifiable Micro-Credentials
National Diploma: Electrical Engineering (N1-N6)
• Mathematics (N6): 85%
• Electro-technics (N6): 78%
• Power Machines (N6): 82%
• Industrial Electronics (N6): 76%
Completed Mini Courses to Download
Download Mini Course Certificates
Subject
Date
Action
Eskom: Substation Maintenance (Task WE12)
• Performed routine maintenance on 132kV switchgear, following safety protocols and documenting results.
• 03/15/2025]
Schneider: PLC Programming (Task WA1408)
• Developed and debugged control logic for an automated assembly line using Unity Pro.
• 04/10/2025]
Workplace Evidence
ORCID
Code & Projects
Research & Publications
Historical Records
Direct links to verifiable artifacts.
Traceable Audit Trail
Every skill is documented, every competency is verifiable. The career is no longer a static resume, but a living, auditable document of mastery.
NotebookLM


THE COMPLETE IDEF SYSTEM ARCHITECTURE
I. CORE ARCHITECTURE
Mathematical Modeling
• Calculus (Integrals for cumulative time/cost, Derivatives for rates of completion)
Process Visualization
• Logigrams for workflows
• Algorigrams for decision-tree logic
Automation Engine
• Visual Basic (VBA) with custom data structures and event-driven dashboards
140u
II. KEY APPLICATION DOMAINS
Curriculum Development
• NATED N1-N6, Advanced Diplomas
• Didactic Systems (De Lorenzo, Lucas-Nülle)
Legal & Regulatory
• SAQA/NQF/DHET alignment
• CCMA dispute tracking, PSIRA licensing
Advanced Domains
• AI/ML, Cyber-physical systems
• Smart Grids, Renewables
20m
III. AUDIT-READY OUTPUTS
Portfolio of Evidence (PoE)
• Academic results, WBL logs
• Psychometric evaluations
Credential Record Tabulation
• Audit-grade tracking of costs, awards, and integration points
Traceability & Reporting
• Automated audit trails with export modules to GitHub, ORCID, and Archive.org
20m
Every component is meticulously modeled for seamless integration and verifiable performance. This schematic defines the complete operational framework.
NotebookLM


SYSTEMIC IMPACT: FROM INDIVIDUAL COMPETENCE TO NATIONAL RESILIENCE
POWERING THE NATION
CHALLENGE
Addressing the backlog of 3.4 million unelectrified households.
SOLUTION
Graduates are equipped to design and implement hybrid grid/off-grid solutions using solar, wind, and hydropower.
FUELING INDUSTRY 4.0
CHALLENGE
Preparing the workforce for smart factories, IoT, and automation.
SOLUTION
Curriculum integrates PLC programming, SCADA systems, AI/ML, and cybersecurity, aligned with partners like Schneider and Eaton.
BUILDING A POLYMATH WORKFORCE
CHALLENGE
Moving beyond narrow specialization to solve complex, systemic problems.
SOLUTION
The framework develops resilient, multidisciplinary engineers who understand the intersection of technology, compliance, and socio-economic development.
NotebookLM


A MODERN CAREER IS NOT A RESUME.
IT IS A PORTFOLIO OF EVIDENCE.
The resume is the polished cover; the real story is in the messy, instructive pages of continuous growth. A modern technical career is a living document, document, written daily through learning, resilience, and adaptation. It is built in every lab experiment, every certificate earned, every bureaucratic battle fought, and every project delivered. This blueprint provides the architecture to build it with integrity and precision.
NotebookLM

Operation GENIAC

An Integrated Framework for National Security, Industrial Modernization, and Educational Alignment

Defense & Security

Systems & Compliance

Education & Accreditation

SYSTEMS ARCHITECT: TSHINGOMBE FISTON | ID: ENG-EDU-TECH-001

NotebookLM

The National Integration Challenge

South Africa faces a critical disconnect between three strategic domains:

1. **Specialized Military Skills:** Valuable competencies within the SANDF (e.g., Umkhonto Field Engineer Regiment) remain siloed from civilian industrial needs.
2. **Aging Industrial Infrastructure:** Critical systems in energy and manufacturing require modernization, but this demands a workforce with verifiable, high-integrity technical skills.
3. **Fragmented Educational Pathways:** A gap exists between theoretical TVET college curricula (N1-N6) and the practical, security-cleared competencies required for national projects, making skills verification through bodies like SAQA and QCTO complex.

NotebookLM

The Solution: Operation GENIAC

Mission Statement: "Traceable. Auditable. Ethical."

Core Concept: Operation GENIAC is a multidisciplinary initiative that integrates Military Combat Engineering, Security Systems, and Technical Oversight into a unified framework. Our mission is to engineer safety, enforce standards, and validate credentials through military-grade logic.

Key Domains

Engineering Police: Automation logic for collision scenarios and technical oversight.

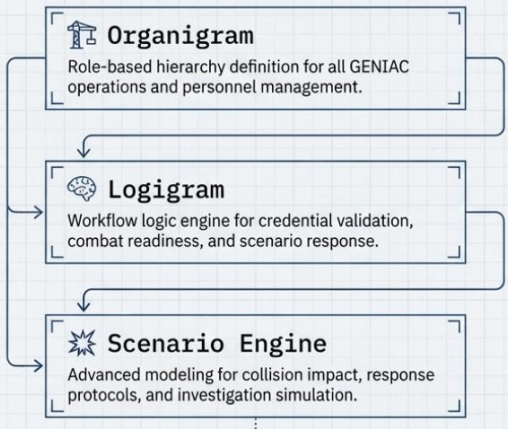
Systems Architecture: A logic-based control system for metering, infrastructure automation, and compliance tracking.

Credentialing & Auditing: A validation engine for aligning military, vocational (NQF), and industrial qualifications.

NotebookLM

01 // Technical Architecture

The GENIAC ecosystem is built on modular components that handle specific operational needs, from role-based hierarchy to workflow logic validation and scenario modeling.


Organigram
Role-based hierarchy definition for all GENIAC operations and personnel management.
Logigram
Workflow logic engine for credential validation, combat readiness, and scenario response.
Scenario Engine
Advanced modeling for collision impact, response protocols, and investigation simulation.

Integrated Partners Brigade 119 Edutech Lab GWorkshop

NotebookLM

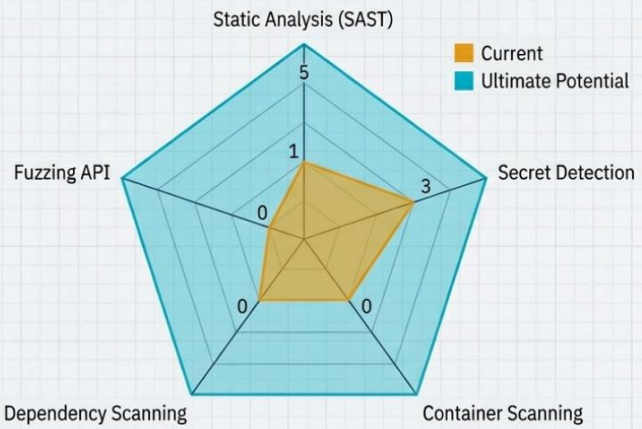
02 // Security & Compliance Engine

GENIAC's infrastructure is managed with a "Security-as-Code" philosophy, enabling automated auditing and vulnerability detection.

Key Takeaway:

- Detects hardcoded secrets in repository history.
- Scans Infrastructure as Code (Terraform, Kubernetes) for misconfigurations.
- Simulates external attacks on running applications (DAST).

****Security Capabilities Analysis****



NotebookLM

Case Study: The S.E.E.E.I.S.U.A. Strategic Mandate

Support for **E**nergy-**E**fficient **E**lectrical & **I**ndustrial **S**ystems in **S**outh **U**nion **A**frica

S.E.E.E.I.S.U.A. is the unified regulatory and operational framework that deploys the GENIAC system to modernize South Africa's critical infrastructure. It integrates civilian energy systems, industrial metering, and military-grade standards under a peace-driven, intergovernmental initiative.

NotebookLM

Deconstructing the S.E.E.E.I.S.U.A. Framework

Component	Strategic Area	Key Function/Validation Context
Security & Standards	Regulatory Compliance	PSIRA regulation, enforcement of training standards, meter audits.
Engineering (Military/Civil)	Defense Skills Mobilization	Utilization of Umkhonto Field Engineer Regiment competencies.
Education & EdTech	Human Capital Development	Implementation of personalized, AI-driven learning (Mindspark).
Electro-technical Standards	Measurement & Quality Control	Adherence to IEEE 1459, MIL-STD-810H (ruggedization), MIL-STD-461G (EMI).
Infrastructure & Policy	Strategic Investment & Localization	City Power substation modernization, DTIC industrial localization mandate.
Skills Utilization & Automation	Technical Implementation	Deployment of GENIAC AI/HPC workflows for auditing and configuration.
Accreditation & Assurance	Quality and Governance	SAQA/QCTO quality assurance monitoring, integration of military standards.

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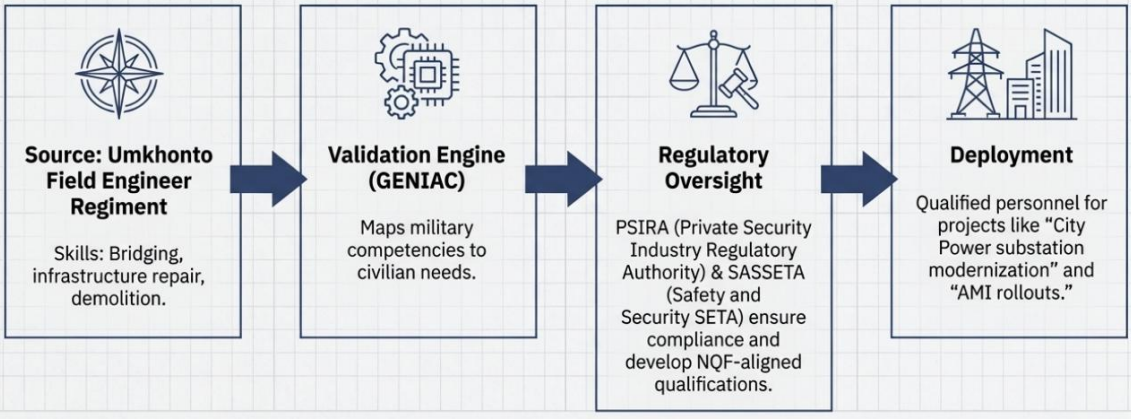
The Military-to-Civilian Skills Transfer Pathway

S.E.E.E.I.S.U.A. creates a formal Recognition of Prior Learning (RPL) pathway to transfer specialized skills from the SANDF's reserve forces into the civilian economy for critical infrastructure projects.


Source: Umkhonto Field Engineer Regiment
Skills: Bridging, infrastructure repair, demolition.
Validation Engine (GENIAC)
Maps military competencies to civilian needs.
Regulatory Oversight
PSIRA (Private Security Industry Regulatory Authority) & SASSETA (Safety and Security SETA) ensure compliance and develop NQF-aligned qualifications.
Deployment
Qualified personnel for projects like "City Power substation modernization" and "AMI rollouts."

NotebookLM

03 // The Architect: A Profile of Integrated Expertise

Tshingombe Tshitadi Fiston

- Systems Architect & National-Grade Curriculum Designer
- Technical Educator & Compliance Strategist
- Specialist in Electrical Engineering, Defense Systems, and Educational Policy

- Electrical Engineering
- Security & Defense Systems
- Educational Frameworks

'The portfolio of evidence is not a personal history, but the foundational research for a national framework. It is the validation for a system designed to bridge the gap between military precision, industrial necessity, and educational potential."

NotebookLM

Core Competency: Electrical & Systems Engineering

A multi-faceted educational and vocational background provides the technical bedrock for the GENIAC system, encompassing both theoretical principles and hands-on industrial practice.

Evidence Highlights

Vocational Qualifications (RSA)	Foreign Qualifications	Practical Trade Skills
• NATED Programme (N1-N6) in Electrical Engineering subjects like Electro-Technology and Industrial Orientation from St Peace College.	• Preparatory Certificate in Maths, Physics, and Electrical/Mechanical Technology (ISPTKIN, DR Congo). • Certificate in Computer Science (UNIKIN, DR Congo).	• Documented competencies as an Industrial Electrician, including fault-finding, control panel wiring, and commissioning of AC/DC systems.

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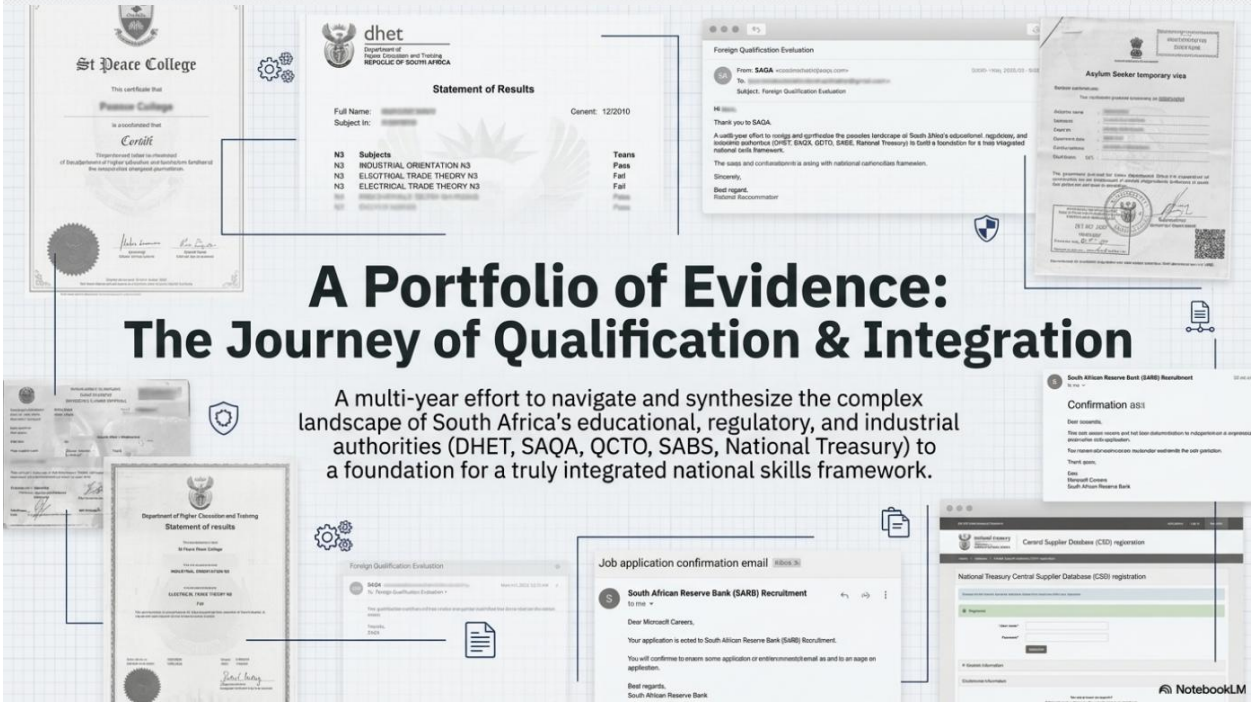
Core Competency: Security, Defense & Regulatory Frameworks

Extensive research, training, and professional engagement in national and international security protocols, providing the strategic oversight necessary for high-stakes infrastructure projects.

Key Areas of Expertise

- **Military Systems Engineering**: Knowledge of SANDF structures and military standards (MIL-STD) for hardware ruggedization and system verification.
- **Civilian Security Oversight**: Deep familiarity with the mandates of PSIRA, SASSETA, and SAQA for security qualification and accreditation.
- **Law Enforcement Technology**: Engagement with Metropolitan Police (UK) systems, including applications for roles like CTSFO Tactical Advisor and Infrastructure Engineer, and training on 'Removing Barriers to Officer Accountability.'
- **Specialized Systems**: Design concepts for 'Intelligence Fencing Systems' and 'Engineering Police' forensic technology.

NotebookLM


St Peace College
dhet
Statement of Results
Foreign Qualification Evaluation
Asylum Seeker temporary visa
A Portfolio of Evidence:
The Journey of Qualification & Integration
A multi-year effort to navigate and synthesize the complex landscape of South Africa's educational, regulatory, and industrial authorities (DHET, SAQA, QCTO, SABS, National Treasury) to a foundation for a truly integrated national skills framework.
Statement of results
Job application confirmation email
South African Reserve Bank (SARB) Recruitment
National Treasury Central Supplier Database (CSD) registration
NotebookLM

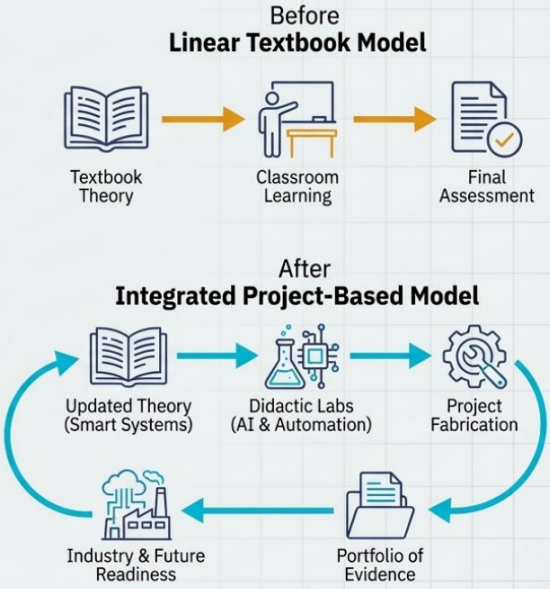
Blueprint for Curriculum Reform in TVET Electrical Engineering

Identified Weaknesses

- Outdated trade theory omitting smart systems, IoT, and renewables.
- Minimal portfolio development and no project fabrication.
- Weak exposure to control systems (PLCs, SCADA).

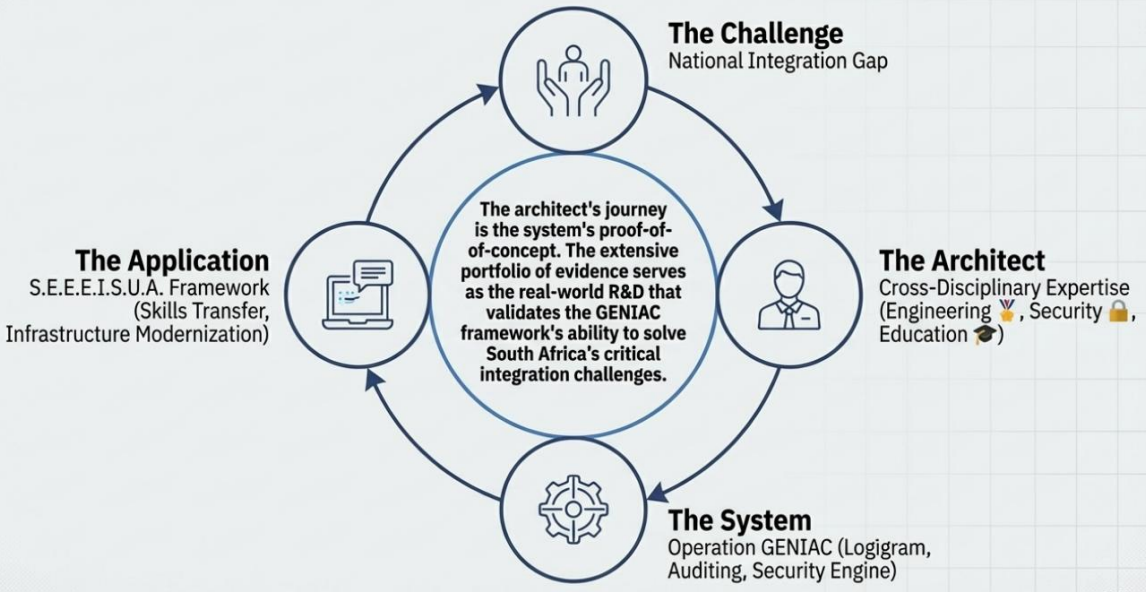
Proposed Enhancements

1. **Integrate Modern Systems:** Update trade theory with modules on Smart Grids, Industry 4.0, and Renewable Energy Labs (referencing De Lorenzo systems).
2. **Mandate Portfolio Development:** Implement a formal system for showcasing learner projects and competencies, aligned with SAQA requirements.
3. **Introduce Advanced Didactic Labs:** Incorporate hands-on training with AI-enhanced systems and automation modules.



NotebookLM

The Synthesis: From Personal Portfolio to National System


The Challenge
National Integration Gap
The Architect
Cross-Disciplinary Expertise (Engineering, Security, Education)
The System
Operation GENIAC (Logigram, Auditing, Security Engine)
The Application
S.E.E.E.I.S.U.A. Framework (Skills Transfer, Infrastructure Modernization)
The architect's journey is the system's proof-of-of-concept. The extensive portfolio of evidence serves as the real-world R&D that validates the GENIAC framework's ability to solve South Africa's critical integration challenges.

NotebookLM

Engineering a Sovereign & Secure Future

The S.E.E.E.I.S.U.A framework, powered by Operation GENIAC, offers a scalable, peace-driven solution to unify energy regulation, industrial metering, and strategic infrastructure across South Africa. It empowers municipalities, commissioners, and engineers to collaborate under a shared vision of efficiency, security, and sovereign capability.

GENIAC CERTIFIED

NotebookLM

The GENIAC Dossier

An Integrated Framework for Technical Education, Security, and Industrial Policy

Evidence Portfolio | Systems Architecture | Qualification & Accreditation Submission

NotebookLM

A Unified System for National Technical & Security Capability

This dossier provides the evidence for an integrated system—**Operation GENIAC**—designed to unify technical education, military-grade engineering logic, and industrial security under a single, auditable framework.

The system connects three core domains:

Pedagogy

A comprehensive curriculum architecture from foundational trade skills (NQF Levels 1-6) to advanced didactic laboratories.

Technology

A secure, modular IT infrastructure for credentialing, scenario modeling, and operational oversight, prototyped on enterprise-grade platforms.

Policy

A strategic framework (S.E.E.E.I.S.U.A.) for aligning skills development with national infrastructure goals and regulatory compliance (SAQA, PSIRA, DHET).

Objective of this Dossier: To submit this body of work for holistic validation and strategic implementation.

NotebookLM

Section 01: Foundational Competence – Academic & Vocational Record

A multi-year educational journey spanning foundational science and computer science in the DRC, followed by specialized NATED electrical engineering studies in South Africa. **This forms the basis for a formal Foreign Qualification Evaluation by SAQA.**

DRC Qualifications

2006: UNIKIN
Certificate, Mathematics & Computer Science
(MS DOS, Word, Excel)

2007: ISPTKIN
Preparatory Certificate
(Mathematics, Physics, Chemistry, Electrical & Mechanical Technology)

RSA Qualifications & Studies

2020: St Peace College
Certificate in Electrical
(Safety, Design & Distribution Boards, Sockets)

2023: DHET NATED Statement of Results (N3 Level)

Note: Full transcript includes ongoing studies and attempts across N1-N6 levels, forming part of the submission to SAQA (Ref: 20191130002).

NotebookLM

Section 02: The Strategic Mandate – **The S.E.E.E.I.S.U.A. Framework**

A National Framework for Energy, Industry, and Security

S.E.E.E.I.S.U.A. (Support for Energy-Efficient Electrical & Industrial Systems in South Union Africa) is a proposed intergovernmental framework to unify regulation, infrastructure development, and skills deployment.

Security & Standards (PSIRA, SABS)
Engineering (Military & Civil Integration)
Infrastructure & Policy (Metering, Grids)
S.E.E.E.I.S.U.A.
Skills Utilization & Automation (GENIAC Engine)
Education & EdTech (NQF, AI-driven Learning)
Electro-technical Standards (IEEE 1459, MIL-STDs)
Accreditation & Assurance (SAQA, QCTO)

> **"To offer a scalable, peace-driven solution to unify energy regulation, industrial metering, and strategic infrastructure across South Union Africa."**

NotebookLM

Section 03: The Operational Engine – Operation GENIAC

Engineering Safety and Validating Credentials Through Military-Grade Logic

Traceable . Auditable . Ethical

A modular system designed to manage personnel, validate workflows, and model complex scenarios.

Organigram

Defines role-based hierarchies for all personnel and operations. Manages command and control structures.

Logigram

A workflow logic engine for credential validation, combat readiness assessment, and automated scenario scenario response protocols.

Scenario Engine

Provides advanced modeling for collision impacts, security breach responses, and forensic investigation simulations.

Key Integrations: Brigade 119, Edutech, Lab GWorkshop.

NotebookLM

Section 04: Pedagogical Architecture – A Multi-Layered Didactic Framework

Layer 4	Future Skills & AI Fluency	Integration of Sci-Bono ICT Academy's AI Fluency Program (AI Basics, Generative AI, Responsible AI) and research topics in Nanotechnology.
Layer 3	Sectoral & Legal Compliance (SETA Integration)	SASSETA MQA Mining Qualifications Authority SASSETA (Specialist Security Practices, PSIRA Grades), MQA (Mining Qualifications), and legal frameworks (POPIA, CCMA rulings, Learnership Agreements).
Layer 2	Advanced Didactic Laboratories (De Lorenzo System Integration)	Hands-on modules for Smart Grids & Power Engineering, Electric Machines with AI Integration, Industry 4.0 (SCADA, IoT), Automotive Systems (ABS/ESP), and Renewable Energies (RENLAB).
Layer 1	Foundational Trade Skills (NSQF Level 5 Alignment)	Electrical safety (Fire Triangle, CPR), Ohm's & Kirchhoff's Laws, AC/DC circuit theory, use of electrician hand tools (BIS standards), workshop practice (filing, drilling, riveting).

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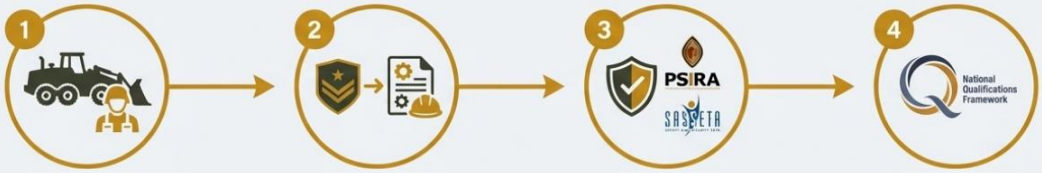
Section 05: The Security & Regulatory Nexus

Integrating Military Precision with Civilian Compliance



Skills Source (Military)

Cites the specialized capabilities of the South African Army Engineer Formation (e.g., Umkhonto Field Engineer Regiment) in bridging, infrastructure repair, and demolitions.

Recognition of Prior Learning (RPL) Pathway

Maps these military competencies to civilian needs in infrastructure projects like substation modernization and smart meter rollouts.

Regulatory & Accreditation Body (Civilian)

Shows how PSIRA (Private Security Industry Regulatory Authority) and SASSETA (Safety and Security SETA) provide the formal oversight.

Qualification Framework

Explains that all training is aligned with the National Qualifications Framework (NQF), ensuring standards are met and qualifications are portable, as jointly implemented by PSIRA and SASSETA.

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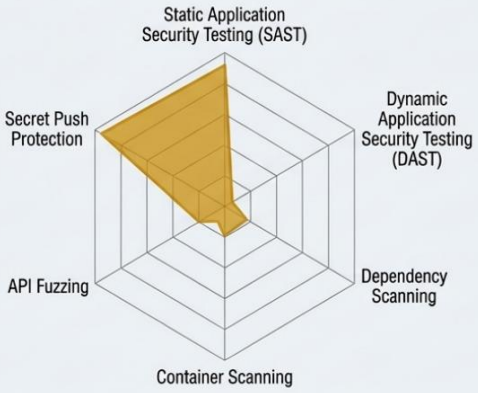
Section 06: Prototyping & Development – The GitLab Proving Ground

Platform: Actively utilizing a GitLab Ultimate & GitLab Duo Enterprise trial (Expires: January 9, 2026).

Security Capabilities Radar Chart



High Score (Outer Edge) = Enabled;
Low Score (Center) = Available but Not Yet Enabled

Deployment Roadmap

Phase 1: Deployed — Credential MVP & Electrical Diploma Validator (Visual Basic).

Phase 2: In Progress — Combat Scenario Investigation Engine.

Phase 3: Planned — Full Edutech Integration with NQF Tracking Dashboard.

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Section 07: Commercial Application & Valuation

Defining a Portfolio of High-Value Technical & Strategic Services

Key Service Offerings

- **Strategic Consulting**: Business engineering, policy framework development.
- **Technical Instruction & Curriculum Design:** Database architecture, circuit logic, PLC automation, professional IT curriculum.
- **Infrastructure & Energy Systems:** Government/municipal metering, solar panel manufacturing, 3-phase cable supply, AC/DC load analysis.
- **Security & Forensics:** Police engineering, forensic technology, detective systems.

Financial Scale (from Xero Executive Summary, Aug 2023)

ZAR 1.27 Billion — Gross Profit	133.8% — Net Profit Margin
ZAR 9.1 Billion — Debtors / Accounts Receivable	14 — Invoices Issued
ZAR 121.5M — Average Invoice Value	

Note: Data reflects the configured scale of operations within the Xero business management trial.

NotebookLM

Section 08: Engagement with National & Global Institutions

A Consistent Record of Proactive Outreach to Key Industry and Government Stakeholders

Category 1: Global Technology & Industry
Inter

Microsoft
Ford
Schneider Electric
elektor
Google Pay & Wallet Console

Category 2: South African National Institutions
Inter

Sub-category (Financial)

South African Reserve Bank

Sub-category (Regulatory)

SABS
SAQA
dhet
QCTO
National Treasury

Sub-category (State-Owned Enterprise)

City Power

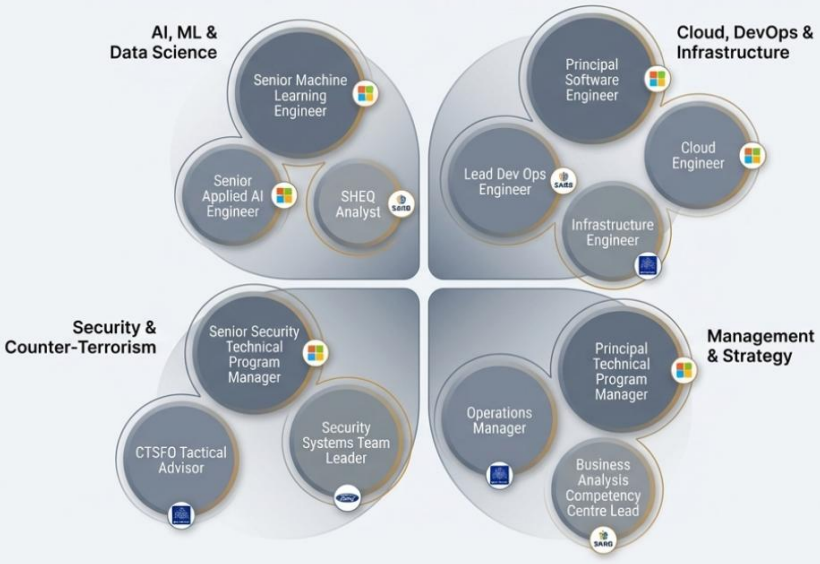
Category 3: International Security & Law Enforcement
Inter

METROPOLITAN POLICE
NEW YORK CLE

NotebookLM

Section 09: Career Trajectory – A Pattern of High-Level Ambition

Analysis of job applications reveals a targeted pursuit of senior roles at the intersection of technology, security, and systems management.



NotebookLM

Section 10: The Formalization Process — The DHET & SAQA Case File

Objective: To achieve a single, integrated qualification recognition for a portfolio of evidence that combines:

1. Foreign qualifications from the DRC.
2. South African NATED vocational studies (N1-N6).
3. Extensive, self-developed frameworks, curricula, and technical projects.

Status & Key Correspondence

The case is active and ongoing with both DHET and SAQA.

- **SAQA:** Foreign Qualification Evaluation process initiated (Ref: 20191130002). Communication history includes requests for re-uploading documents due to technical issues.
- **DHET:** Correspondence regarding examination irregularities and results from St Peace College.
- **National Treasury:** CSD registration for government tenders completed; queries logged regarding scope of work (Ref: 1579995).

CONFIDENTIAL

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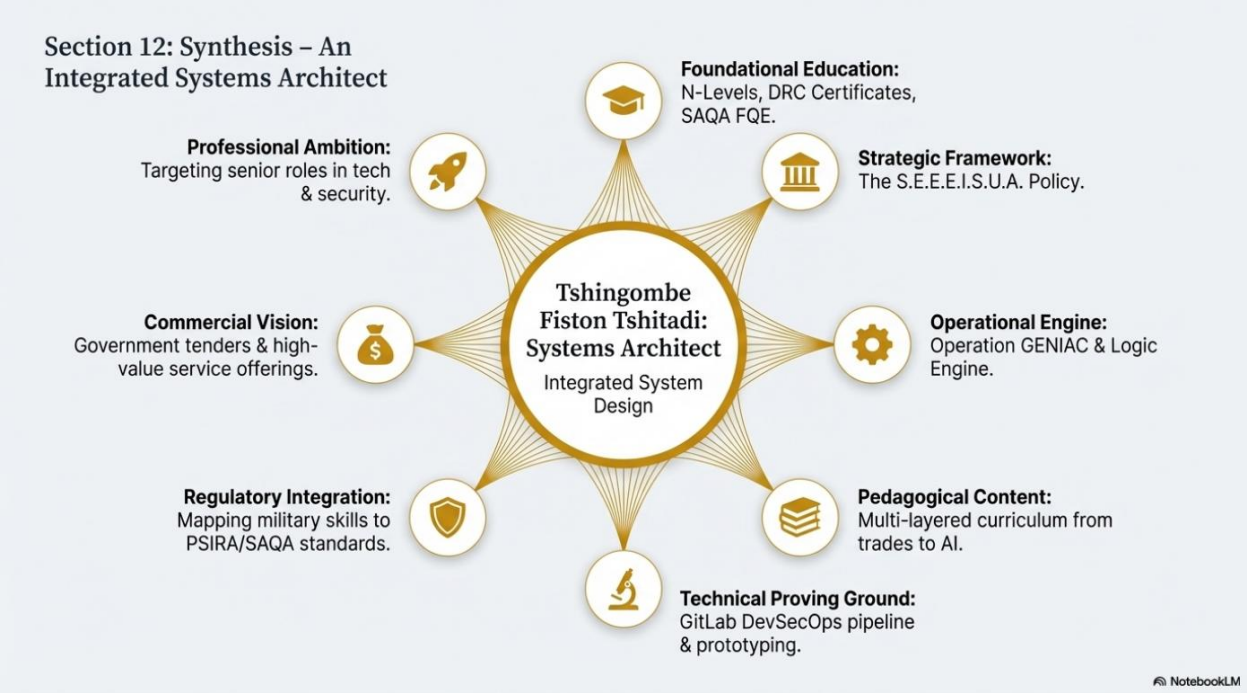
Section 11: Tangible Outputs – The GENIAC Credentialing System

Proposed accreditation and licensing artifacts generated by the GENIAC framework.

License Certificate
Certifies: Tshingombe Tshitadi as an Assessor & Moderator in Engineering Education.
Standards: Aligned with SAQA NQF Levels and QCTO requirements.

NotebookLM


Section 12: Synthesis – An Integrated Systems Architect
Foundational Education: N-Levels, DRC Certificates, SAQA FQE.
Strategic Framework: The S.E.E.E.I.S.U.A. Policy.
Professional Ambition: Targeting senior roles in tech & security.
Tshingombe Fiston Tshitadi: Systems Architect
Integrated System Design
Commercial Vision: Government tenders & high-value service offerings.
Operational Engine: Operation GENIAC & Logic Engine.
Regulatory Integration: Mapping military skills to PSIRA/SAQA standards.
Pedagogical Content: Multi-layered curriculum from trades to AI.
Technical Proving Ground: GitLab DevSecOps pipeline & prototyping.
NotebookLM

Dossier Submission: A Call for Integrated Review and Partnership

The evidence compiled within this dossier demonstrates a cohesive and deeply developed system connecting pedagogy, military-grade logic, industrial application, and regulatory compliance. The work represents not just a collection of skills, but a fully architected solution.

Request: This dossier is submitted for a holistic review that recognizes the integrated nature of this work. We propose moving beyond a fragmented, subject-by-subject evaluation to assess the architected system as a whole, opening a dialogue on pathways for formal qualification and strategic partnership.

NotebookLM

SUBJECT:	Tshingombe Tshitadi Fiston
CASE FILE:	ENG-SEC-EDU-2025
STATUS:	Active Review
SCOPE:	980+ Page Portfolio (NATED N1-N6 Qualifications, Technical Frameworks, Strategic Policy)

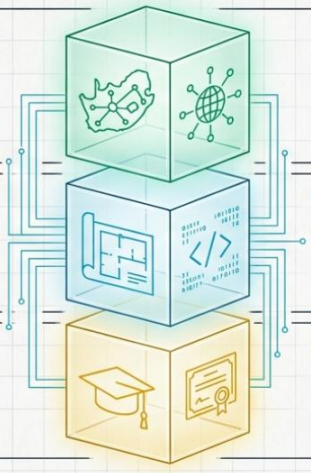
The Tshingombe Dossier: A Unified Framework for Engineering, Security, and Education

An investigative overview of a multi-domain portfolio integrating technical accreditation, systems architecture, and strategic industrial policy.

NotebookLM

A Deliberate Synthesis of Three Foundational Pillars

This dossier presents a singular body of work constructed upon three distinct but integrated pillars. Each pillar builds upon the last, culminating in a comprehensive strategic vision.



THE VISION: The Strategist

The articulation of the 'S.E.E.E.I.S.U.A.' framework, a national-level strategy to unify South Africa's industrial, educational, military, and security infrastructure.

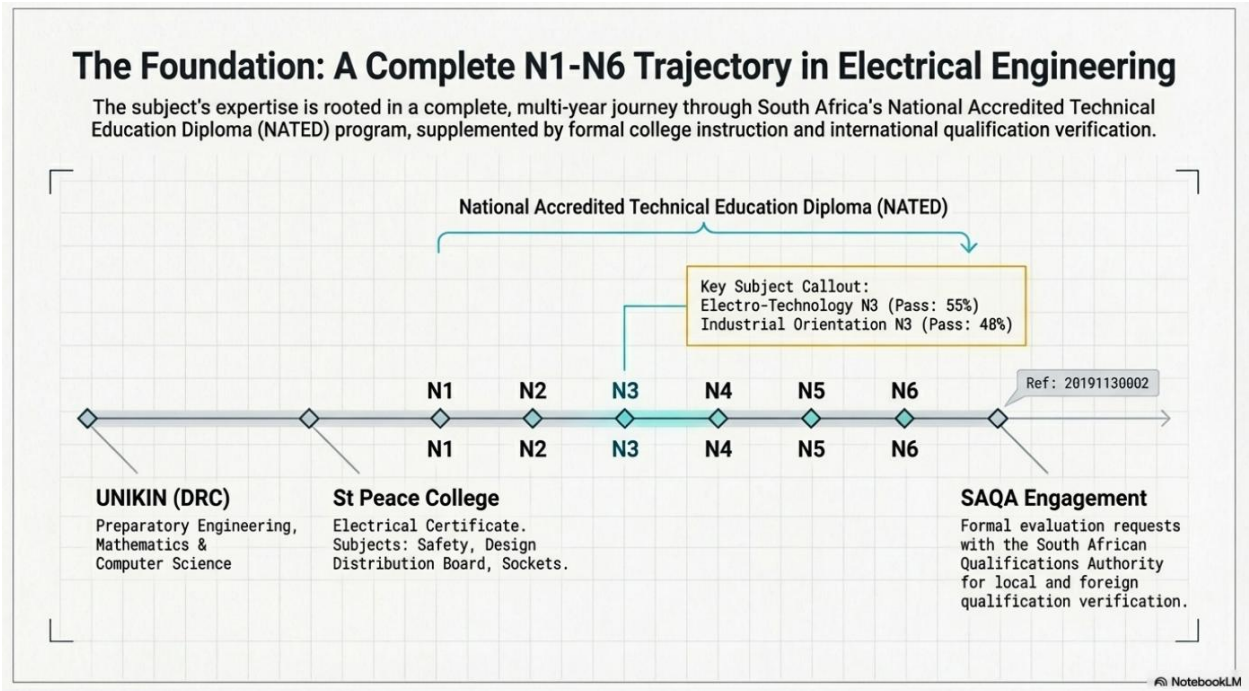
THE ARCHITECTURE: The Builder

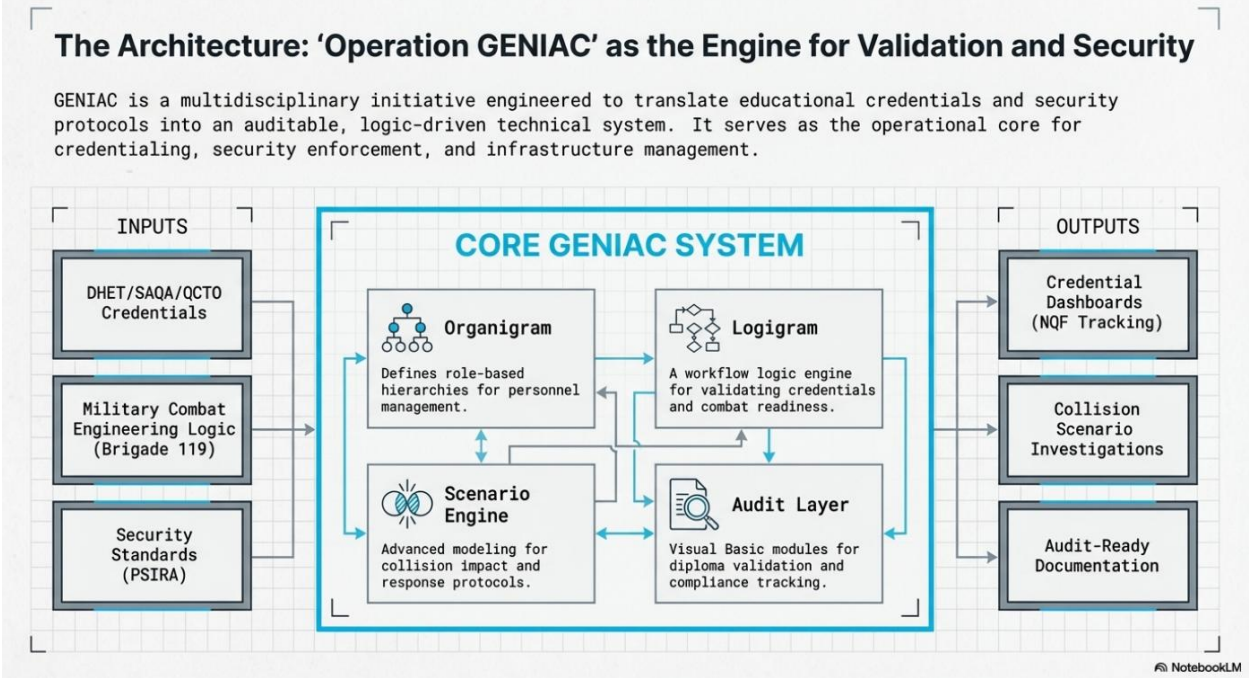
The design and implementation of 'Operation GENIAC,' a modern, modular technical framework for credential validation, security logic, and operational auditing, built on enterprise-grade DevSecOps principles.

THE FOUNDATION: The Learner

A persistent and verifiable pursuit of technical mastery NATED N1-N6 Electrical Engineering qualification pathway and engagement with national accreditation bodies (SAQA, DHET).

NotebookLM

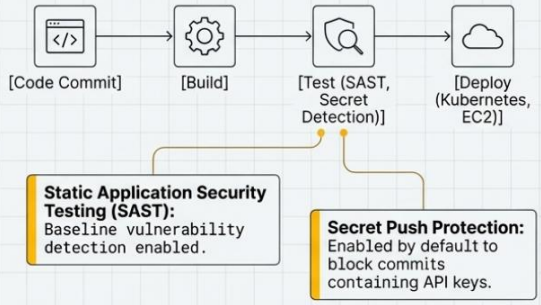

The Foundation: A Complete N1-N6 Trajectory in Electrical Engineering
The subject's expertise is rooted in a complete, multi-year journey through South Africa's National Accredited Technical Education Diploma (NATED) program, supplemented by formal college instruction and international qualification verification.
National Accredited Technical Education Diploma (NATED)
Key Subject Callout:
Electro-Technology N3 (Pass: 55%)
Industrial Orientation N3 (Pass: 48%)
N1 N2 N3 N4 N5 N6
Ref: 20191130002
UNIKIN (DRC)
Preparatory Engineering, Mathematics & Computer Science
St Peace College
Electrical Certificate. Subjects: Safety, Design Distribution Board, Sockets.
SAQA Engagement
Formal evaluation requests with the South African Qualifications Authority for local and foreign qualification verification.
NotebookLM


The Architecture: 'Operation GENIAC' as the Engine for Validation and Security
GENIAC is a multidisciplinary initiative engineered to translate educational credentials and security protocols into an auditable, logic-driven technical system. It serves as the operational core for credentialing, security enforcement, and infrastructure management.
INPUTS
DHET/SAQA/QCTO Credentials
Military Combat Engineering Logic (Brigade 119)
Security Standards (PSIRA)
CORE GENIAC SYSTEM
Organigram
Defines role-based hierarchies for personnel management.
Logigram
A workflow logic engine for validating credentials and combat readiness.
Scenario Engine
Advanced modeling for collision impact and response protocols.
Audit Layer
Visual Basic modules for diploma validation and compliance tracking.
OUTPUTS
Credential Dashboards (NQF Tracking)
Collision Scenario Investigations
Audit-Ready Documentation
NotebookLM

Engineering a Secure and Modern Development Lifecycle for GENIAC

The GENIAC project is managed within an enterprise-grade GitLab Ultimate environment, leveraging a full suite of modern DevSecOps and security scanning tools. The trial period (expiring Jan 2026) is actively used to establish a robust security posture.

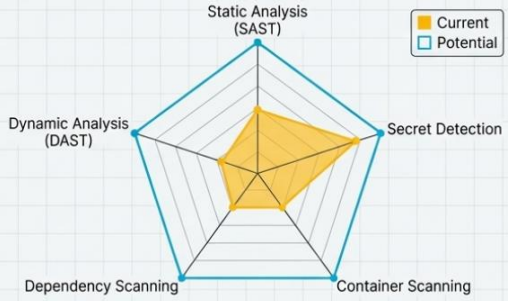
CI/CD Pipeline



Static Application Security Testing (SAST): Baseline vulnerability detection enabled.

Secret Push Protection: Enabled by default to block commits containing API keys.

GENIAC Security Scanning Posture

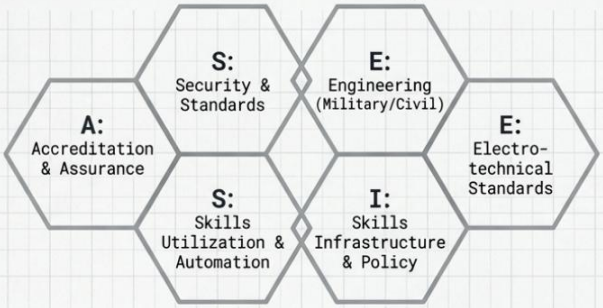


****Future Enablement:** DAST, Dependency Scanning, and Container Scanning planned to simulate external attacks and flag vulnerable libraries.

NotebookLM

The Vision: S.E.E.E.I.S.U.A. - A Unified Strategy for South Union Africa

The "Support for Energy-Efficient Electrical & Industrial Systems in South Union Africa" (S.E.E.E.I.S.U.A.) is a proposed regulatory and operational framework. It aims to integrate civilian infrastructure, industrial metering, and military-grade standards under a peace-driven, intergovernmental initiative.


S: Security & Standards
E: Engineering (Military/Civil)
A: Accreditation & Assurance
E: Electro-technical Standards
S: Skills Utilization & Automation
I: Skills Infrastructure & Policy

Mission: "To engineer a scalable, peace-driven solution unifying energy regulation, industrial metering, and strategic infrastructure."

Vision: "To empower municipalities, commissioners, and engineers to collaborate under a shared vision of efficiency, security, and compliance."

Author: "Tshingombe Tshitadi Fiston (National-grade curriculum architect, technical educator, and compliance strategist)."

NotebookLM

Deconstructing the S.E.E.E.I.S.U.A. Strategic Mandate

| Component	Strategic Area	Key Function / Validation Context	Referenced Standards / Entities
Security & Standards	Regulatory Compliance	PSIRA regulation, enforcement of minimum training standards, physical security mandates.	PSIRA, SASSETA
Engineering (Mil/Civil)	Defense Skills Mobilization	Utilization of Umkhonto Field Engineer Regiment competencies (bridging, infrastructure repair).	SA Army Engineer Formation
Education & EdTech	Human Capital Development	AI-driven learning (Mindspark), psycho-pedagogical foundations, technical proficiency.	EdTech Institute, UNICEF
Electro-technical	Measurement & Quality		
		Adherence to standards for Advanced Metering Infrastructure (AMI) and power measurement.	IEEE 1459, AFSEC
Infrastructure & Policy	Strategic Investment	City Power substation modernization, industrial localization mandate.	City Power, DTIC
Skills & Automation	Technical Implementation	Deployment of AI/HPC workflows via the GENIAC framework.	GENIAC, Nextflow
Accreditation & Assurance	Quality and Ruggedization	SAQA/QCTO quality monitoring, integration of military-grade hardware integrity standards.	SAQA, QCTO, MIL-STD-810H

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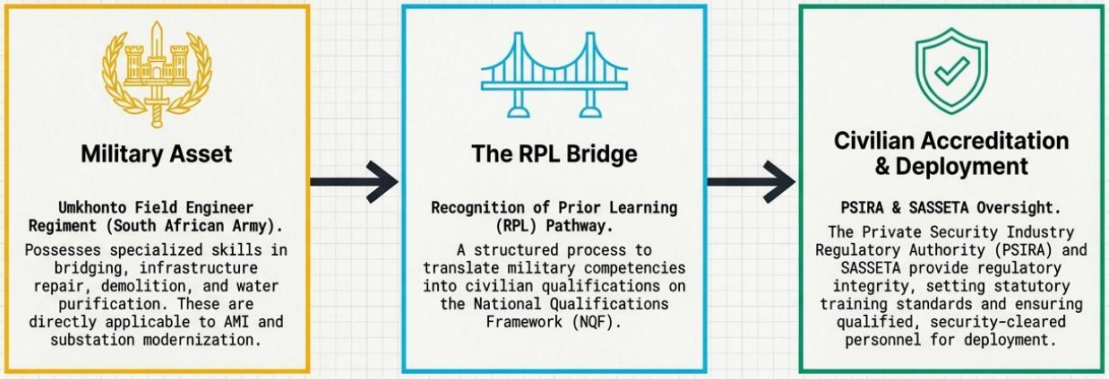
Bridging Two Worlds: A Formal Pathway for Military-to-Civilian Skills Transfer

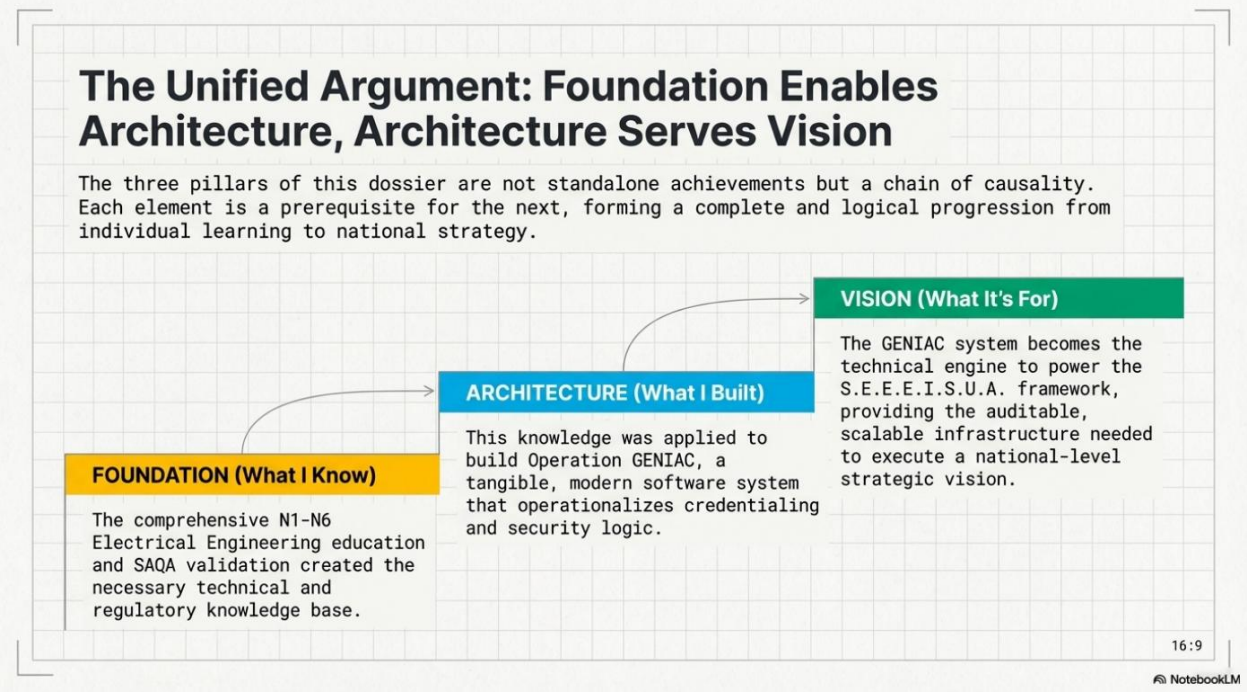
A core strength of the S.E.E.E.I.S.U.A. framework is its mechanism for leveraging the specialized skills of military reserve forces for critical national infrastructure projects, all under strict regulatory oversight.


Military Asset
Umkhonto Field Engineer Regiment (South African Army).
Possesses specialized skills in bridging, infrastructure repair, demolition, and water purification. These are directly applicable to AMI and substation modernization.
The RPL Bridge
Recognition of Prior Learning (RPL) Pathway.
A structured process to translate military competencies into civilian qualifications on the National Qualifications Framework (NQF).
Civilian Accreditation & Deployment
PSIRA & SASSETA Oversight.
The Private Security Industry Regulatory Authority (PSIRA) and SASSETA provide regulatory integrity, setting statutory training standards and ensuring qualified, security-cleared personnel for deployment.

Bridging Two Worlds: A Formal Pathway for Bine 16:9

NotebookLM

A Portfolio of Proactive Engagement Across Technology, Finance, and Security
The principles outlined in this dossier have been actively applied through formal job applications, technical inquiries, and legal submissions to a wide array of leading national and international organizations.
Technology & Engineering
Finance & Governance
Security & Law Enforcement
Microsoft
Ford
Schneider Electric
SOUTH AFRICAN RESERVE BANK
national treasury
METROPOLITAN POLICE
Key Project Highlight
Schneider Electric License Project (Case #113117217): An ongoing case focused on validating and supporting a license project tied to career exhibition and innovation outcomes, demonstrating direct industry partnership efforts.
16:9
NotebookLM


The Unified Argument: Foundation Enables Architecture, Architecture Serves Vision
The three pillars of this dossier are not standalone achievements but a chain of causality. Each element is a prerequisite for the next, forming a complete and logical progression from individual learning to national strategy.
FOUNDATION (What I Know)
The comprehensive N1-N6 Electrical Engineering education and SAQA validation created the necessary technical and regulatory knowledge base.
ARCHITECTURE (What I Built)
This knowledge was applied to build Operation GENIAC, a tangible, modern software system that operationalizes credentialing and security logic.
VISION (What It's For)
The GENIAC system becomes the technical engine to power the S.E.E.E.I.S.U.A. framework, providing the auditable, scalable infrastructure needed to execute a national-level strategic vision.
16:9
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The Dossier: A Coherent, Actionable, and Substantial Body of Work

980+ Pages of compiled evidence, academic records, technical documentation, and policy research.

6 Levels of the NATED National Diploma in Electrical Engineering achieved and documented (N1-N6).

1 Fully architected technical framework (Operation GENIAC) for security, auditing, and credentialing.

1 Comprehensive national strategy (S.E.E.E.I.S.U.A.) for integrating industrial, educational, and military systems.

This unified portfolio represents a complete, evidence-based case for qualification and strategic capability.

16:9

NotebookLM

The GENIAC Dossier

An Integrated Framework for Technical Education, Security, and Industrial Systems

Evidence Portfolio of Tshingombe Fiston Tshitadi

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Mission Brief: **A Unified Framework for Engineering, Security, and Education**

TRACEABLE. AUDITABLE. ETHICAL.

Operation GENIAC integrates Military Combat Engineering principles, advanced Security Systems, and rigorous Technical Oversight to create a unified framework for industrial infrastructure and workforce credentialing.

Engineering & Police Systems

Applying systematic logic to safety, investigation, and automation.

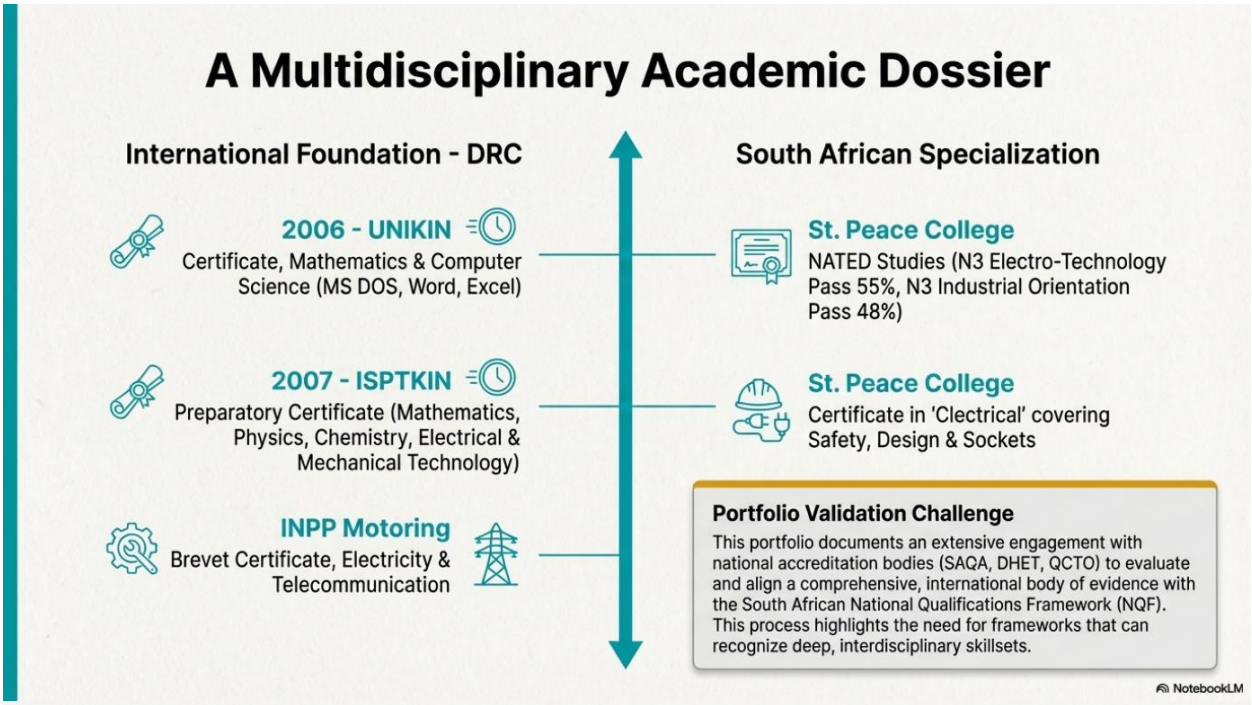
Educational Architecture

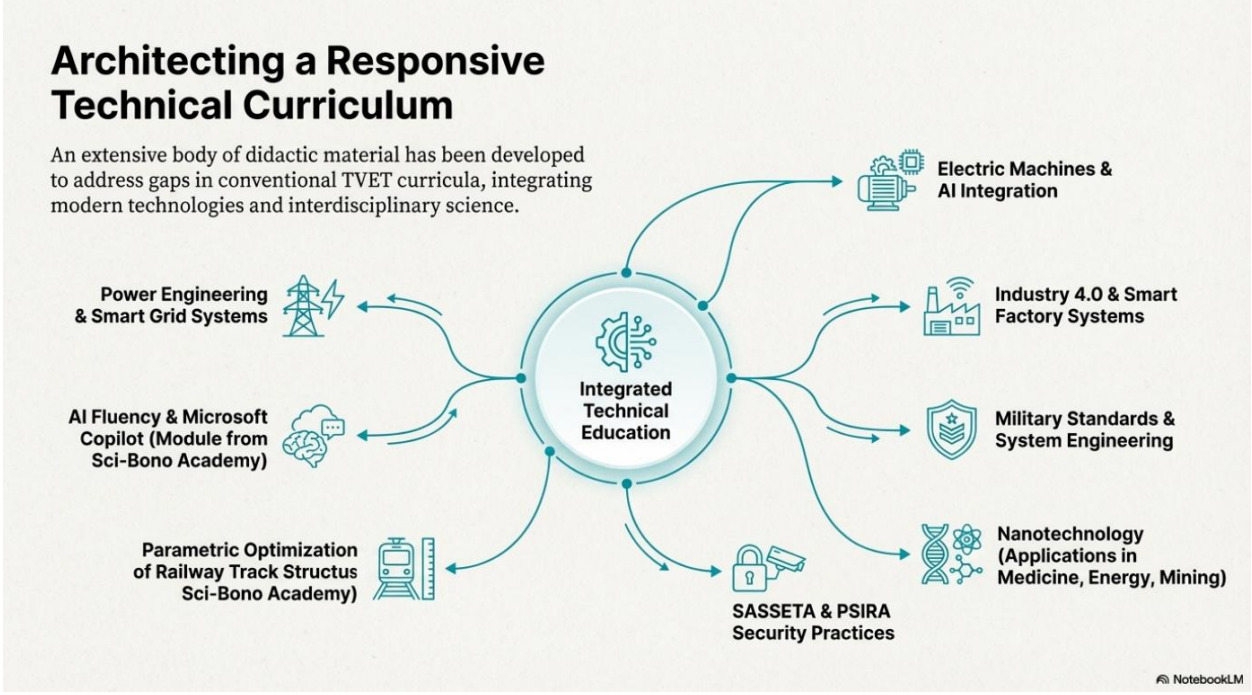
Building a comprehensive, responsive curriculum from foundational trades to advanced technology.

Regulatory & Policy Integration

Aligning technical standards (SABS, IEEE) with national qualification frameworks (SAQA, QCTO) and security protocols (PSIRA, Military Standards).

NotebookLM


A Multidisciplinary Academic Dossier
International Foundation - DRC
2006 - UNIKIN
Certificate, Mathematics & Computer Science (MS DOS, Word, Excel)
2007 - ISPTKIN
Preparatory Certificate (Mathematics, Physics, Chemistry, Electrical & Mechanical Technology)
INPP Motoring
Brevet Certificate, Electricity & Telecommunication
South African Specialization
St. Peace College
NATED Studies (N3 Electro-Technology Pass 55%, N3 Industrial Orientation Pass 48%)
St. Peace College
Certificate in 'Clectrical' covering Safety, Design & Sockets
Portfolio Validation Challenge
This portfolio documents an extensive engagement with national accreditation bodies (SAQA, DHET, QCTO) to evaluate and align a comprehensive, international body of evidence with the South African National Qualifications Framework (NQF). This process highlights the need for frameworks that can recognize deep, interdisciplinary skillsets.
NotebookLM


Architecting a Responsive Technical Curriculum
An extensive body of didactic material has been developed to address gaps in conventional TVET curricula, integrating modern technologies and interdisciplinary science.
Integrated Technical Education
Electric Machines & AI Integration
Industry 4.0 & Smart Factory Systems
Military Standards & System Engineering
Nanotechnology (Applications in Medicine, Energy, Mining)
SASSETA & PSIRA Security Practices
Parametric Optimization of Railway Track Structus Sci-Bono Academy)
AI Fluency & Microsoft Copilot (Module from Sci-Bono Academy)
Power Engineering & Smart Grid Systems
NotebookLM

Operation GENIAC: A Logic-Based Framework for Integrated Security

Core Domains

Engineering Police: Applying engineering principles to investigation and standards enforcement.

Collision Scenarios: Advanced modeling for impact analysis and response protocols.

Automation Logic: Engines for credential validation and workflow management.

System Components

Organigram: Defines role-based hierarchies for personnel management.

Logigram: Workflow logic engine for validating credentials and processes.

Scenario Engine: Simulates collision impacts and response protocols.

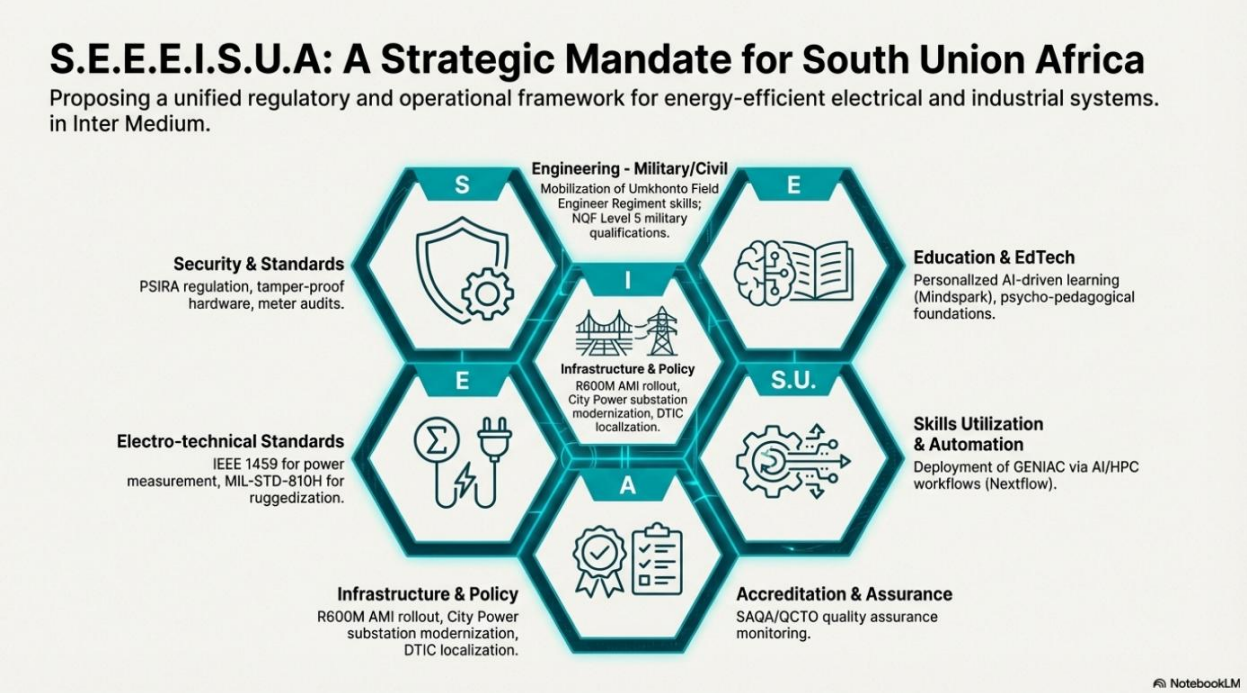
Strategic Partnerships

Brigade 119

Edutech

Lab GWorkshop

NotebookLM


S.E.E.E.I.S.U.A: A Strategic Mandate for South Union Africa
Proposing a unified regulatory and operational framework for energy-efficient electrical and industrial systems. in Inter Medium.
S
Engineering - Military/Civil
Mobilization of Umkhonto Field Engineer Regiment skills; NQF Level 5 military qualifications.
E
Security & Standards
PSIRA regulation, tamper-proof hardware, meter audits.
I
Education & EdTech
Personallzed AI-driven learning (Mindspark), psycho-pedagogical foundations.
Infrastructure & Policy
R600M AMI rollout, City Power substation modernization, DTIC localization.
E
S.U.
Electro-technical Standards
IEEE 1459 for power measurement, MIL-STD-810H for ruggedization.
Skills Utilization & Automation
Deployment of GENIAC via AI/HPC workflows (Nextflow).
A
Infrastructure & Policy
R600M AMI rollout, City Power substation modernization, DTIC localization.
Accreditation & Assurance
SAQA/QCTO quality assurance monitoring.
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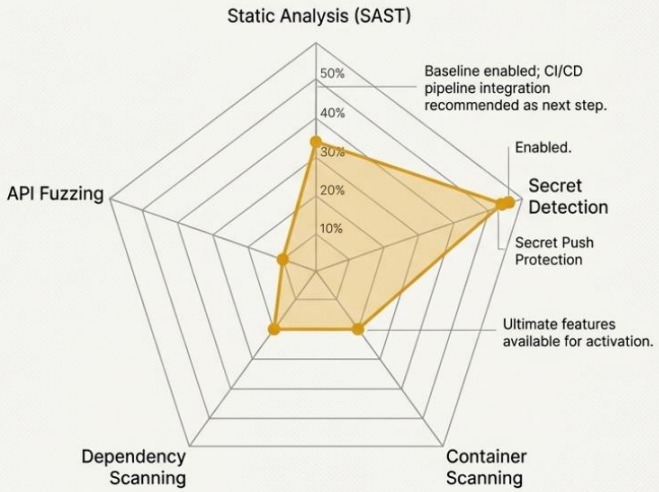
Section 03
Technical Implementation & Prototyping
NotebookLM

The GENIAC Development Environment & Security Posture

An active GitLab Ultimate & Duo Enterprise Trial is established for the "tshingombe OPGENIAC TBRIGADE" project, expiring Jan 09, 2026.

The environment is established with a full suite of enterprise-grade security tools, ready for phased activation.



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System Architecture and Deployment Roadmap

DEPLOYMENT ROADMAP

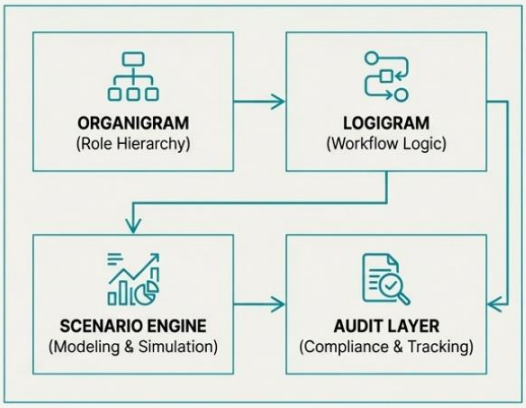
PHASE 1: Credential MVP — Deployed
Credential dashboard, Electrical Diploma Validator.

PHASE 2: Combat Engine — In Progress
Scenario investigation engine, impact modeling.

PHASE 3: Edutech Integration — Planned
Modular curriculum integration, NQF tracking.

PHASE 4: Full Audit Layer — Planned
Visual Basic automation suite for compliance.

CORE TECHNICAL ARCHITECTURE



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A Targeted Spectrum of Professional Aspiration

Microsoft

- Principal Software Engineer
- Senior Machine Learning Engineer
- Senior Security Technical Program Manager
- Senior Applied AI Engineer

Metropolitan Police

- Lead Dev Ops Engineer (Counter Terrorism)
- CTSFO Tactical Advisor
- Infrastructure Engineer

South African Reserve Bank

- Cloud Engineer
- Business Analysis Competency Centre Lead

Ford

- Security Systems Team Leader
- Continuous Improvement Engineering Manager
- Automotive Audio Amplifier Software Dev Engineer

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Evidence of Commercial and Governmental Engagement

Formal Governmental Registration

Legal Name:	Tshingombe
Supplier Application Ref:	R0169241870
Identification Type:	International Securities Identification Number (ISIN)

> "Invited to bid for requirements of the [Municipality]" from SBD form.

Scope of Proffered Services

- Strategic Business & Engineering Consulting
- Technical Curriculum Development & Instruction
- Police, Forensic & Security Systems Engineering
- Municipal Energy Metering & Industrial Systems
- Hardware Manufacturing (Solar Panels, Batteries) & Supply Chain

Financial data from Xero accounting and draft invoices reflect the total projected value of proposed and tendered works, demonstrating the scale of operational ambition.

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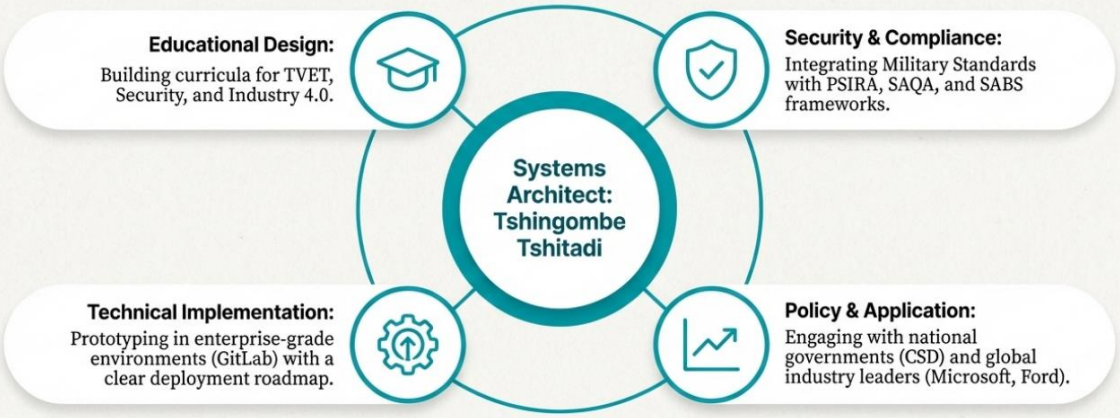
The Unifying Principle: An Integrated Didactic Framework

This dossier presents not merely the credentials of an individual, but the **architectural blueprint** for a comprehensive system that integrates education, security, and engineering under a single, **military-grade logic**.


Educational Design:
Building curricula for TVET, Security, and Industry 4.0.
Security & Compliance:
Integrating Military Standards with PSIRA, SAQA, and SABS frameworks.
Systems Architect: Tshingombe Tshitadi
Technical Implementation:
Prototyping in enterprise-grade environments (GitLab) with a clear deployment roadmap.
Policy & Application:
Engaging with national governments (CSD) and global industry leaders (Microsoft, Ford).

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Operation GENIAC: A Unified Framework for Engineering, Security & Education

Merging military-grade engineering and security standards with civiliian civilian education and regulatory bodies (SAQA, PSIRA) to create a traceable, auditable, and ethical system for South Africa's critical national infrastructure.

Military & Security Systems Integration

Combines military combat engineering skills with civilian security standards (PSIRA) for infrastructure protection.

Education & Credential Validation

Aligns technical training with national qualification frameworks (SAQA/NQF) using modern EdTech platforms.

Industrial & Energy Infrastructure Management

Aims to overhaul systems for energy efficiency and strategic resource control (S.E.E.E.I.S.U.A. policy).

S.E.E.E.I.S.U.A. Strategic Framework Key Pillars

Component	Strategic Area	Key Function
Security & Standards	Regulatory Compliance	PSIRA regulation and enforcement of training standards.
Engineering	Defense Skills Mobilization	Utilization of military engineering competencies (e.g., bridging, repair).
Education & EdTech	Human Capital Development	AI-driven learning and psycho-pedagogical support for technicians.

Strategic Goals & Implementation

Mission: "Traceable. Auditable. Ethical."

The core mission is to engineer safety, enforce standards, and validate credentials.

Credential MVP

2. Combat Engine

3. Edutech Integration

Built on a Modern Technology Stack

Leverages GitLab for CI/CD pipelines, automated security scanning (SAST/DAST), and IaC.

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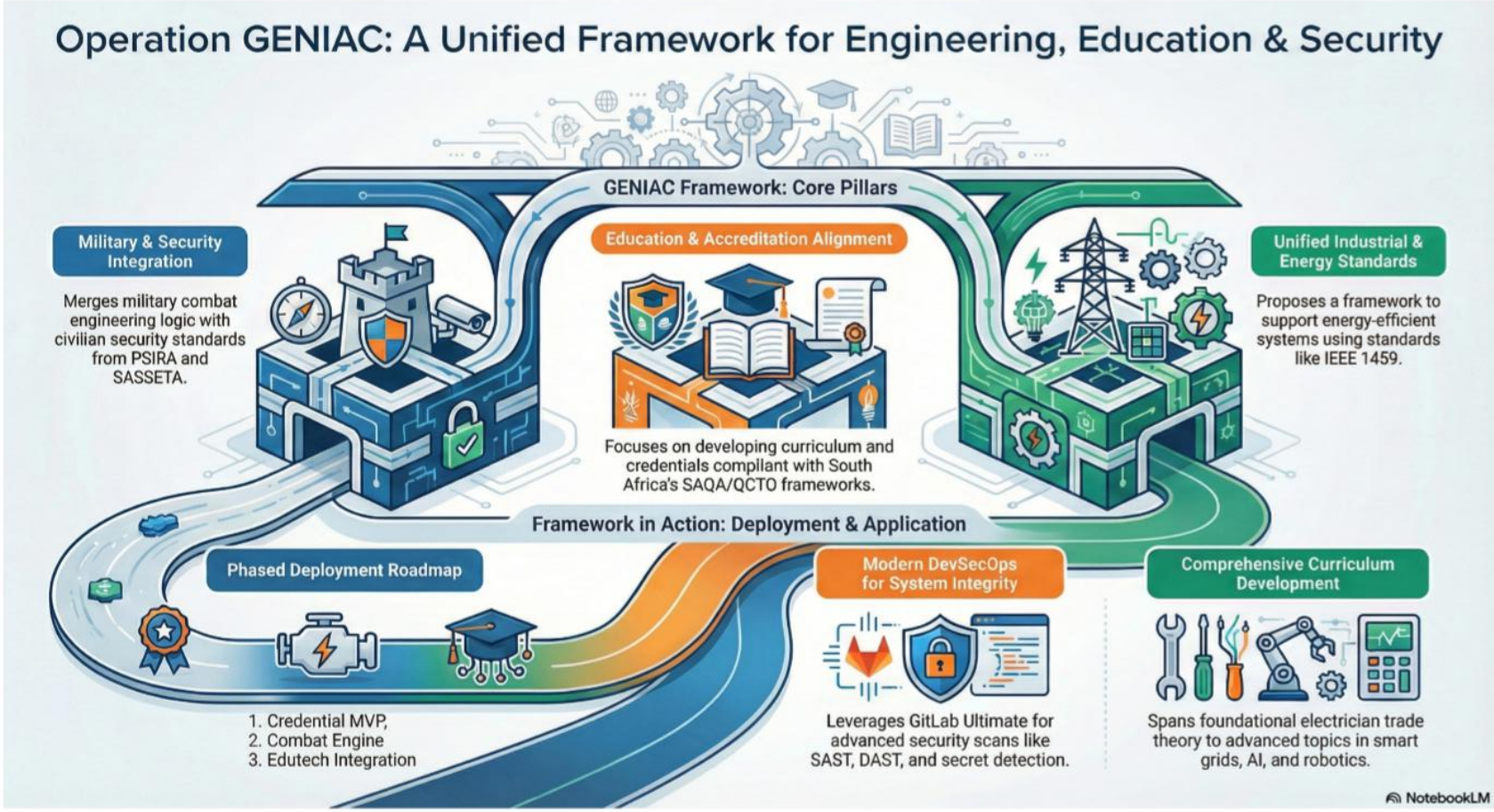
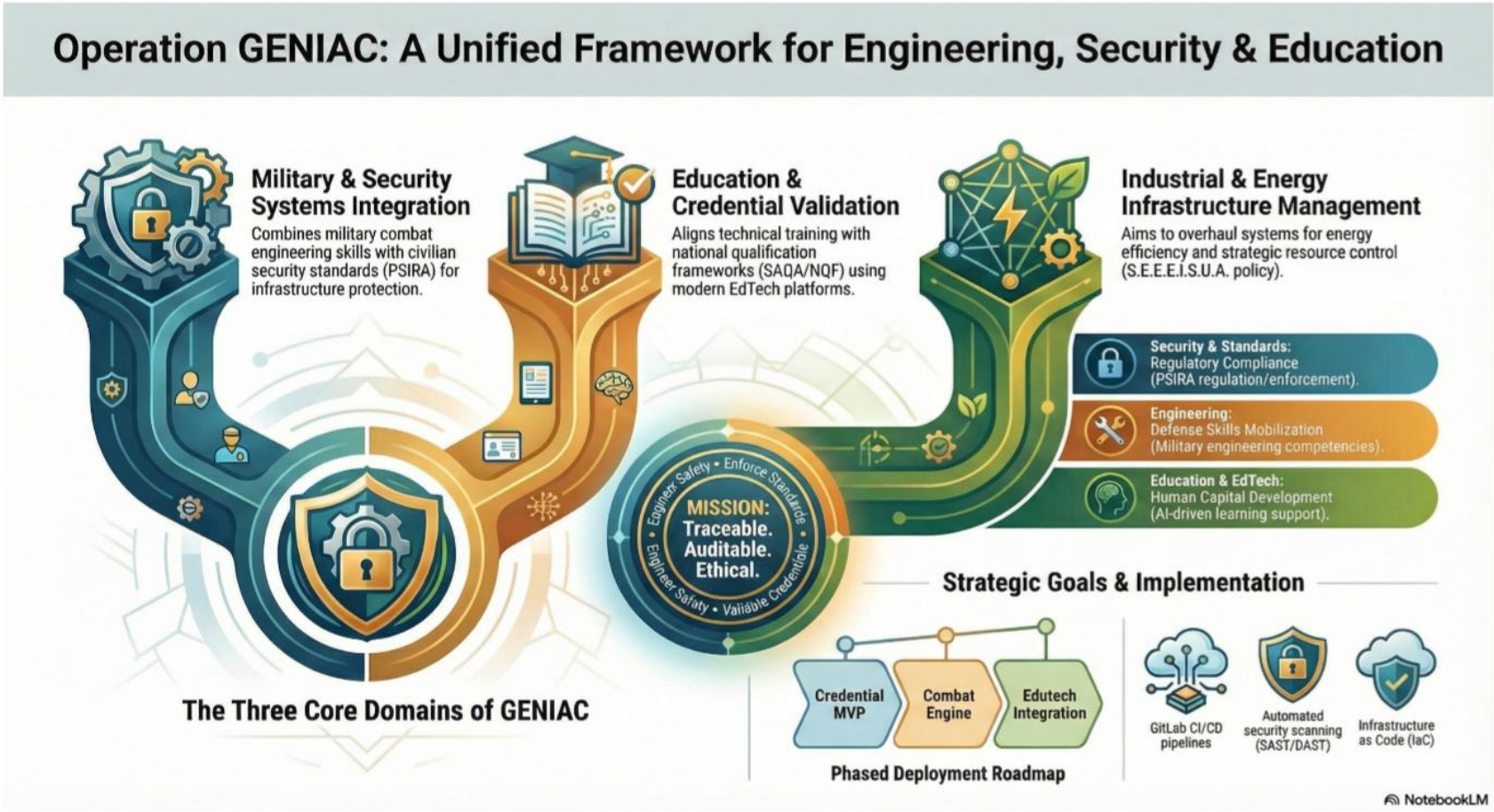

Operation GENIAC: A Unified Framework for Engineering, Education & Security
GENIAC Framework: Core Pillars
Military & Security Integration
Merges military combat engineering logic with civilian security standards from PSIRA and SASSETA.
Education & Accreditation Alignment
Focuses on developing curriculum and credentials compliant with South Africa's SAQA/QCTO frameworks.
Unified Industrial & Energy Standards
Proposes a framework to support energy-efficient systems using standards like IEEE 1459.
Framework in Action: Deployment & Application
Phased Deployment Roadmap
1. Credential MVP,
2. Combat Engine
3. Edutech Integration
Modern DevSecOps for System Integrity
Leverages GitLab Ultimate for advanced security scans like SAST, DAST, and secret detection.
Comprehensive Curriculum Development
Spans foundational electrician trade theory to advanced topics in smart grids, AI, and robotics.
NotebookLM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Security & Standards:
Regulatory Compliance
(PSIRA regulation/enforcement).
Engineering:
Defense Skills Mobilization
(Military engineering competencies).
Education & EdTech:
Human Capital Development
(AI-driven learning support).
Engineer Safety • Enforce Standards • Engineer Safety • Validate Credentials
MISSION:
Traceable.
Auditable.
Ethical.
The Three Core Domains of GENIAC
Strategic Goals & Implementation
Credential MVP
Combat Engine
Edutech Integration
Phased Deployment Roadmap
GitLab CI/CD pipelines
Automated security scanning (SAST/DAST)
Infrastructure as Code (IaC)
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The Tshingombe Framework:
Integrating Engineering, Education & Security

Strategic Frameworks for National Systems

The S.E.E.E.I.S.U.A. Initiative

A proposed framework to unify energy regulation and industrial systems in South Union Africa.

Operation GENIAC: Engineering Safety & Audits

Integrates Military Combat Engineering with security systems to create a traceable, auditable, and ethical framework.

Military-to-Civilian Skills Transfer

A core concept leveraging military skills for civilian projects under PSIRA and SAQA regulatory oversight.

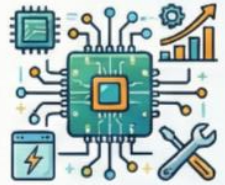
Core Competencies & Qualifications

NQF-Aligned Technical Education

Holds NATED qualifications from St Peace College, with passes in subjects like Electro-Technology N3.

Multi-Sector Career Development

Actively pursuing job applications and tender bids across engineering, ICT, security, and public sectors.



Electrical Trade & Systems Expertise

Skills include circuit theory, fault finding, smart grids, safety protocols, and workshop practice.

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The Investigation Begins with a Puzzle

We begin with a single, highly complex document. It is filled with esoteric phrases, part of a vast, self-designed system. It is so dense, it's almost its own language.

This document immediately poses a question: What kind of mind creates something this ambitious? Who are they?

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NotebookLM

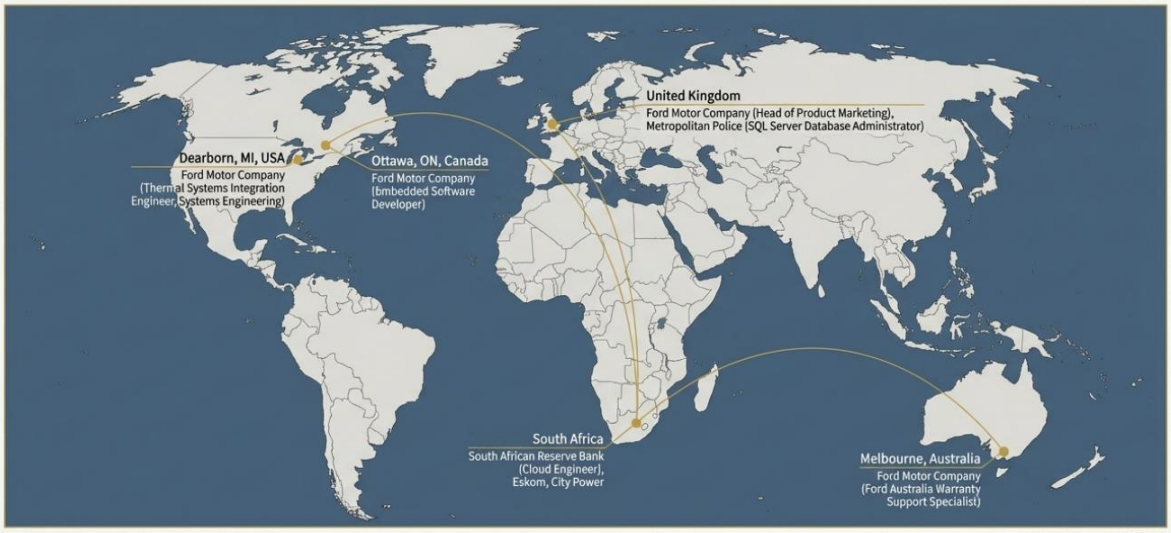
The First Clue: A Name Emerges from the Chaos

Sifting through the digital fragments—emails, course registrations, official forms—a name appears repeatedly, forming the first solid piece of our puzzle: Tshingombe Tshitadi Fiston.

NotebookLM

A Portrait of Relentless, Global Ambition

The data trail reveals a tireless pursuit of a career in engineering and technology, spanning multiple continents and diverse, high-stakes industries.


United Kingdom
Ford Motor Company (Head of Product Marketing), Metropolitan Police (SQL Server Database Administrator)
Dearborn, MI, USA
Ford Motor Company (Thermal Systems Integration Engineer, Systems Engineering)
Ottawa, ON, Canada
Ford Motor Company (Embedded Software Developer)
South Africa
South African Reserve Bank (Cloud Engineer), Eskom, City Power
Melbourne, Australia
Ford Motor Company (Ford Australia Warranty Support Specialist)

NotebookLM

His Ambition is Built on a Deep Technical Foundation

His documents are a testament to a rigorous understanding of advanced electrical engineering. He works from first principles, integrating calculus and complex theories into practical applications, from power systems to AC machines.

Calculus in Action

$$E = \int P(t)\,dt$$

Analyze time-dependent power consumption in circuits.

AC Machine Theory

Creation of **rotating magnetic fields** via the application of "**le blanc theorem**" and "**Ferraris theorem**".

Core Concepts

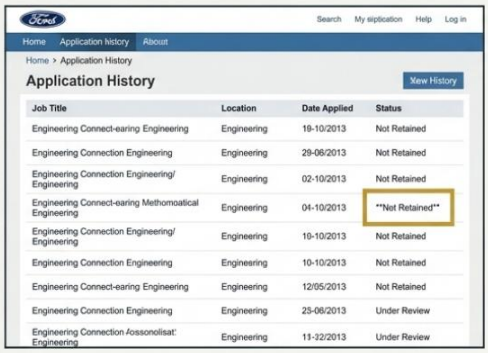
- Direct-Current Machines
- Alternating-Current Theory
- Transformers
- Electronic Power Control
- Programmable Logic Controllers (PLCs)

NotebookLM

The Path is Blocked by Systemic Friction

Despite a relentless global effort, the path to professional fulfillment is consistently obstructed. Applications are rejected, and the validity of his qualifications is questioned by the very systems he seeks to enter.

Rejection



Questioned Credentials

Examination national irregularilarity committee n4-n6...n1-n3 appealing process... All affected candidate who do not received their results immediately must be registered to rerwiten subject...

Excerpt from Departmental Communication, South Africa.

NotebookLM

A Radical Response: If the System is Broken, Build a New One

Faced with institutional barriers, Tshingombe does not retreat. He begins to design a comprehensive, integrated framework to overhaul the entire ecosystem of technical education, industrial application, and government oversight.

PROVISIONAL PROJECT TOPIC: IMPLEMENTATION FRAMEWORK POLICY COLLEGE AND SCHOOL ENGINEERING CIRCULAR ASSESSMENT POLICE EDUCATION TECHNOLOGY TEACH AND TECHNOLOGY ELECTRICAL SUBJECT SCHOOL QUALIFICATION LEVEL IN ENTREPRERSHIP AND INDUSTRIE SOCIETY COMMISSIONING AND GOVERNMENT MUNICIPIPALITY TEAM TRAM TRAINING WORK GRADUATION ENGINEERING TIMEFRAME .ST PEACE COLLEGE SCHOOL ORIENTATION GUIDE MANUEL POLICY

NotebookLM

Pillar I: Architecting a New Framework for Technical Education

The foundation of his system is a complete redesign of the technical curriculum. His framework specifies not just what to teach, but how to integrate it with national standards, corporate needs, and a pedagogy of practical application.

- **Curriculum Integration**: Explicitly links NATED programs (N1-N6) with the South African Qualifications Authority (SAQA) framework.
- **Advanced Mathematics**: Embeds integral and differential functions directly into core modules like Electric Circuits and Electromagnetic Induction.
- **Industry Collaboration:** Proposes direct partnerships with entities like Eskom and City Power to ensure curriculum relevance.
- **Accrediting Bodies:** The framework is designed for compliance with DHET, QCTO, SAQA, and other key accrediting bodies.

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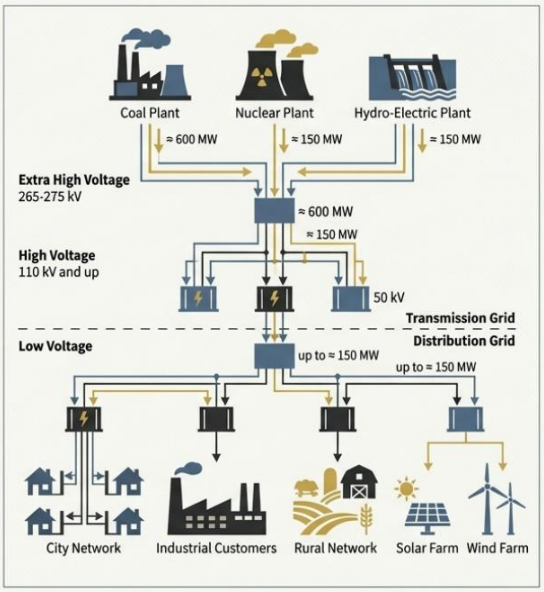
Pillar II: Connecting Education to National Power Infrastructure

Tshingombe's framework extends far beyond the classroom, directly addressing the complexities of the national electrical grid. His research synthesizes data on power generation, distribution, and the shift towards a modernized, "smart" grid.

- Evidence of Research
  - **Grid Management**: Analyzes the roles of Eskom and City Power, including load shedding, load reduction, and electricity procurement from Independent Power Producers (IPPs).
  - **Smart Grids**: Incorporates concepts of Advanced Metering Infrastructure (AMI), demand response, and renewable energy integration.
  - **Technical Schematics**: Utilizes diagrams of high-voltage transmission systems to inform the practical application of his curriculum.

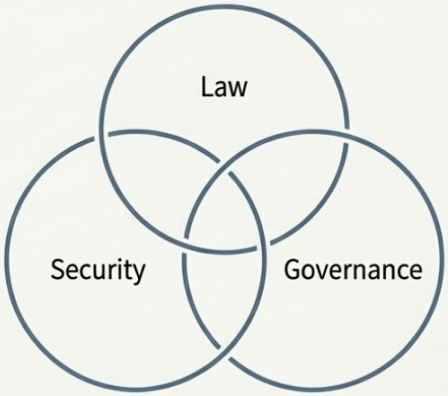


ST. PEACE COLLEGE NotebookLM

Pillar III: A Foundation of Law, Security, and Governance

The system's most unique feature is its integration of legal and security frameworks. It's not just an engineering plan; it's a governance model, designed for integrity, accountability, and compliance.

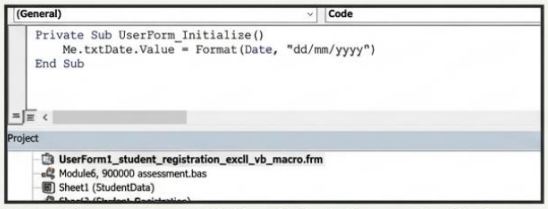
- **Policing & Public Safety**: Incorporates principles from the NYU Policing Project on protest management, de-escalation, and proportional response.
- **Information Security**: Defines and applies the "five pillars of information security" (Identification, Authentication, Authorization, Confidentiality, Integrity) to his framework.
- **Legal Compliance**: References labor law, CCMA procedures, and the process for handling misconduct, affidavits, and legal petitions.
- **Regulatory Adherence**: Aims for compliance with SANS (South African National Standards) and IEC (International Electrotechnical Commission) standards.



ST. PEACE COLLEGE NotebookLM

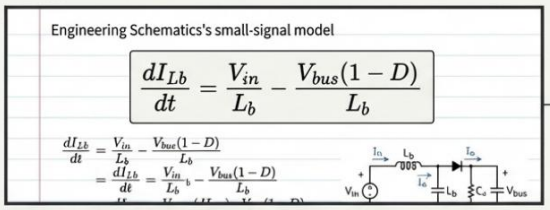
The Tools of Creation: From Code to Pedagogy

This grand vision is not just theoretical. Tshingombe is actively building it, using a diverse toolkit that spans software development, educational material design, and hands-on engineering schematics.

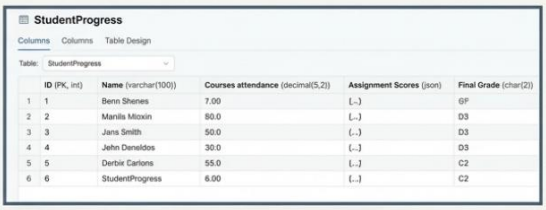


Custom Software Development: VB Macros for Student Assessment and Tracking

Didactic Materials: Physical Electrical Training Kits and Simulation Tools



Engineering Schematics: Handwritten Calculations for Power Electronics Models



Data Systems: Structured Databases for Monitoring and Analysis

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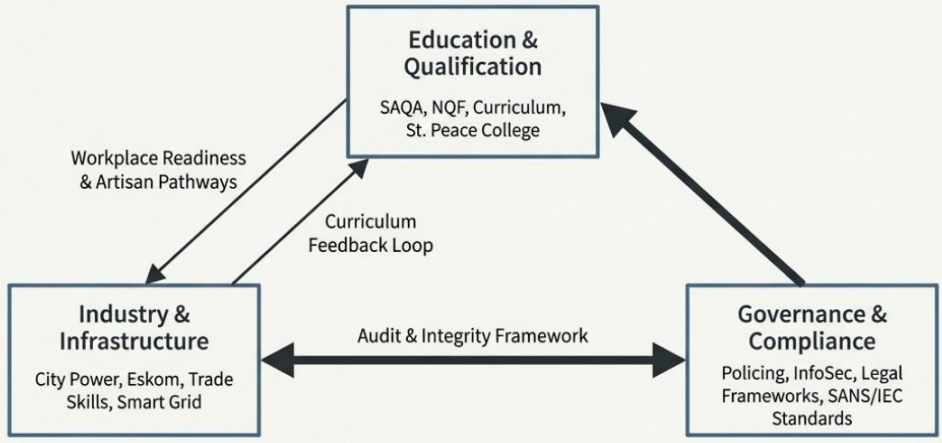
The Result: A Unified Field Theory for a Fractured World

From the scattered digital fragments, a coherent architecture emerges. It's a single, integrated system designed to bridge the gaps between education, industry, and governmance, **creating a logical pathway where he found only friction.**

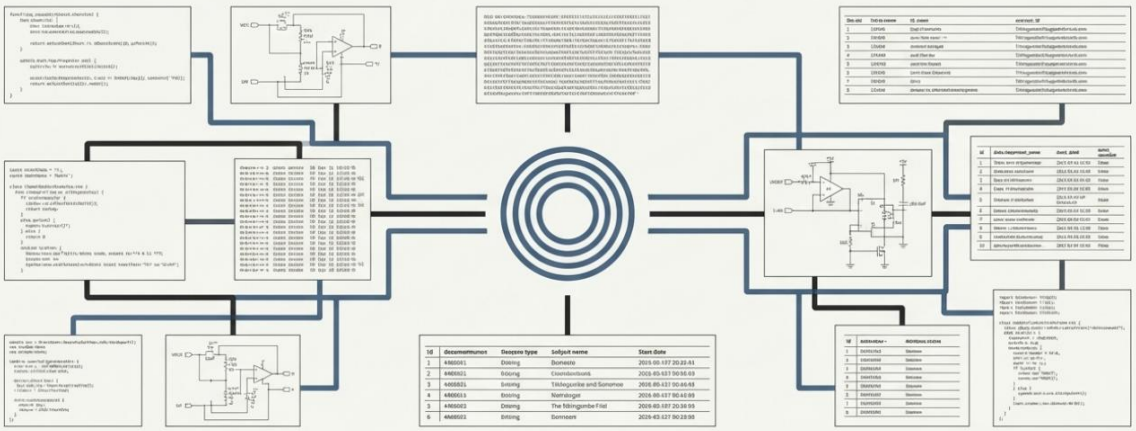

Education & Qualification
SAQA, NQF, Curriculum, St. Peace College
Workplace Readiness & Artisan Pathways
Curriculum Feedback Loop
Industry & Infrastructure
City Power, Eskom, Trade Skills, Smart Grid
Audit & Integrity Framework
Governance & Compliance
Policing, InfoSec, Legal Frameworks, SANS/IEC Standards

St. Peac

NotebookLM

A Portrait in Data

The Tshingombe File is more than a collection of data. It is the story of a formidable intellect confronting a world of systemic barriers. When the pathways were blocked, he responded not with frustration, but with a blueprint for a new world—one built on logic, integration, and order.



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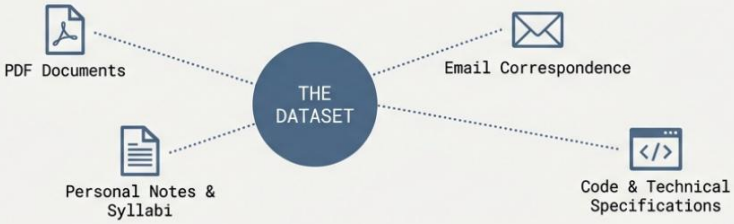
THE TSHINGOMBE FILE: A DIGITAL ARCHAEOLOGY

"What we're about to do here is kind of like digital archaeology. We've got this collection of totally scattered files... and from all these digital bits and pieces, we're going to try to piece together a human story."



This is an investigative report pieced together from a found collection of emails, syllabi, job applications, and personal notes.

Our subject is an individual architecting his own reality in response to the one he inhabits.

INVESTIGATIVE PROMPT: We found documents filled with dense, unique phrases: "integrity guard," "Siri class," "disciplinary governance low." What kind of person creates something this ambitious? To answer that, we have to start by looking for a name. We're hunting for a digital ghost in the machine.

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Exhibit A: Identifying the Subject

AIU
CERTIFICATE
OF PARTICIPATION
This certificate is proudly presented to:
tshingombe tshitadi
For participating in the Class:
From Idea to Reality: A Comprehensiv
Guide to Setting Up Your Own Compa
LIVE CLASS
From Idea to Reality: A Comprehensive Guide to Setting Up Your Own Company
Throughout the duration of the live class session celebrated on 13-Oct-2023, the participant demonstrated a commitment to learning, actively engaged in class discussions and committed to after class assignments.

Profile Summary

ST. PEACE COLLEGE
THE FOUNDATION TO SUCCESS

- **Name:** Tshingombe Tshitadi
- **Email Aliases:** tshingombefiston@gmail.com, tshingombekb@gmail.com
- **Core Domain:** Electrical Engineering
- **Stated Qualification:** NQF Level 6 (Diploma / Advanced Certificate) - Adv Cert: Educ: Technical Education
- **Institutional Affiliation:** St. Peace College

The External World: Navigating the Corporate Maze

1 Ford Motor Company

Thermal Systems Integration Engineer	Status: Not Retained
Systems Engineering	Status: Not Retained
Frames Welding Engineer (South Africa)	Status: Not Retained

2 South African Reserve Bank (SARB)

- Business Analysis Competency Centre Lead
- SHEQ Analyst
- Cloud Engineer

"If your profile corresponds to our requirements, a member of our Recruiting team will contact you."

3 South African Revenue Service (SARS)

SARS

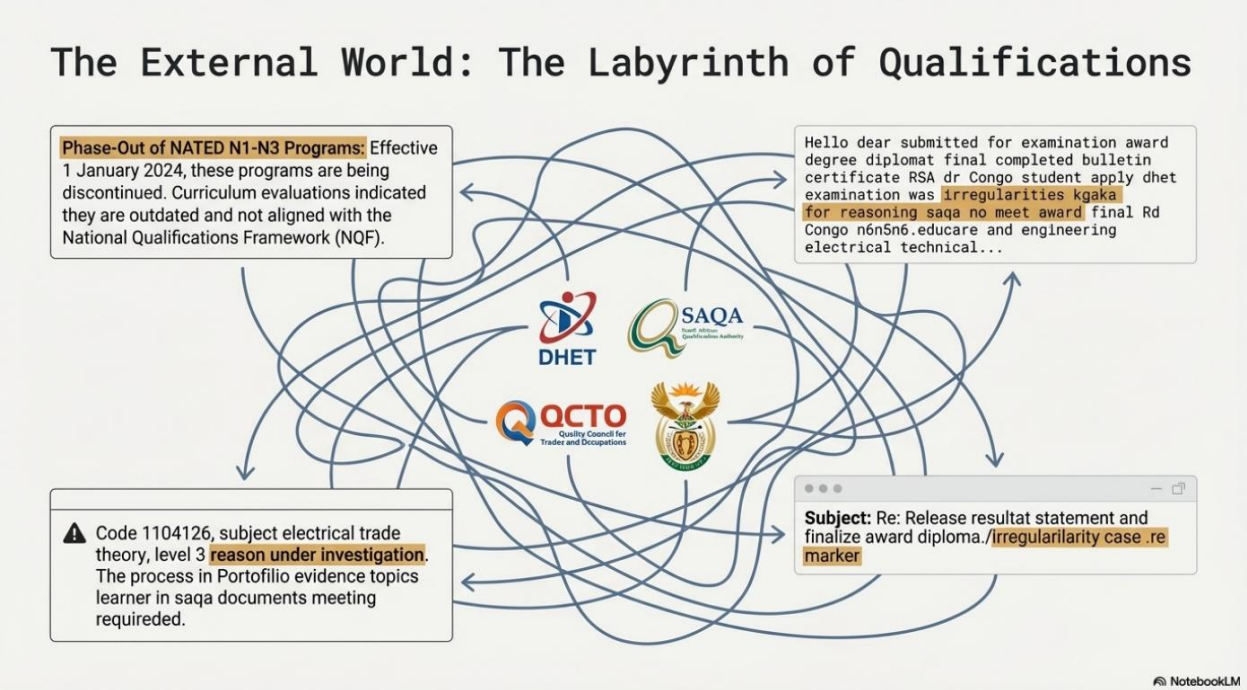
- Auditor
- Digital Fraud Investigator
- Debt Collector (Estates)

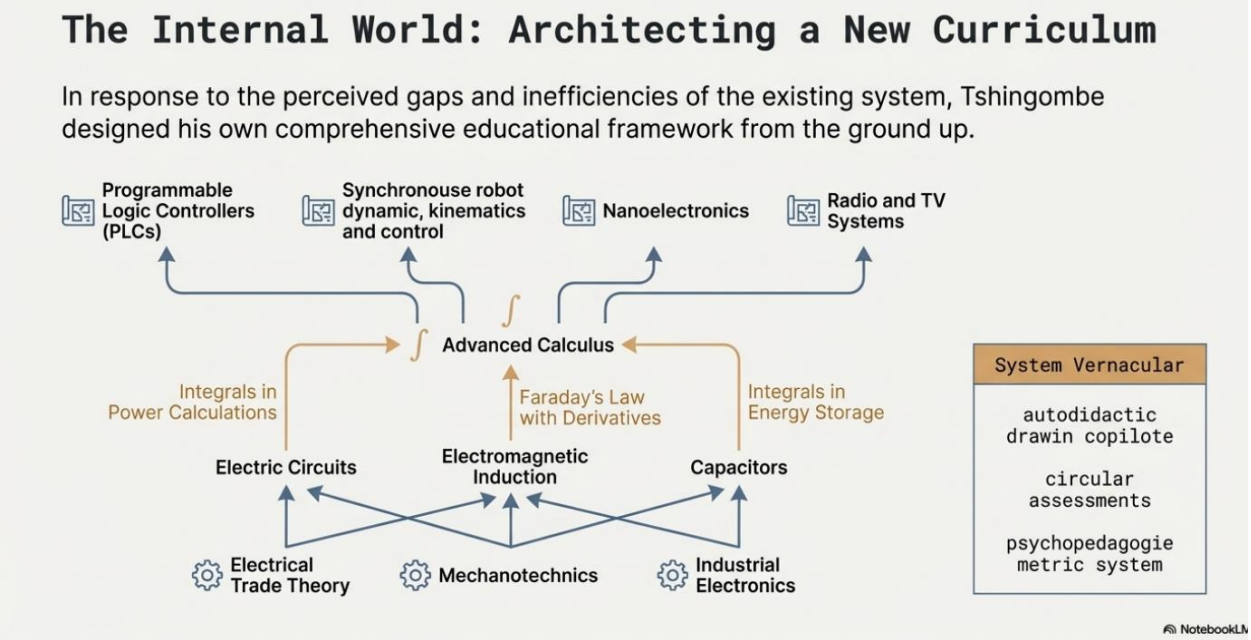
4 Metropolitan Police (UK)

- Experienced Intelligence Analyst
- SQL Server Database Administrator
- Digital Engagement Officer

"You may notice that we move your application from one role to another... if you see the job you applied to in an **Archived state**... please know that this is normal and does not negatively impact your candidacy in any way."

NotebookLM


The External World: The Labyrinth of Qualifications
Phase-Out of NATED N1-N3 Programs: Effective 1 January 2024, these programs are being discontinued. Curriculum evaluations indicated they are outdated and not aligned with the National Qualifications Framework (NQF).
Hello dear submitted for examination award degree diplomat final completed bulletin certificate RSA dr Congo student apply dhet examination was irregularities kgaka for reasoning saqa no meet award final Rd Congo n6n5n6.educare and engineering electrical technical...
DHET
SAQA
QCTO
Code 1104126, subject electrical trade theory, level 3 reason under investigation. The process in Portofilio evidence topics learner in saqa documents meeting requireded.
Subject: Re: Release resultat statement and finalize award diploma./Irregularilarity case .re marker
NotebookLM


The Internal World: Architecting a New Curriculum
In response to the perceived gaps and inefficiencies of the existing system, Tshingombe designed his own comprehensive educational framework from the ground up.
Programmable Logic Controllers (PLCs)
Synchronouse robot dynamic, kinematics and control
Nanoelectronics
Radio and TV Systems
Advanced Calculus
Integrals in Power Calculations
Faraday's Law with Derivatives
Integrals in Energy Storage
Electric Circuits
Electromagnetic Induction
Capacitors
Electrical Trade Theory
Mechanotechnics
Industrial Electronics
System Vernacular
autodidactic drawin copilote
circular assessments
psychopedagogie metric system
NotebookLM

The System in Practice: Calculus as the Engine of Engineering

Industrial Electronics N5: Syllabus Outline

- Module 1: Network Theorems
- Module 2: AC Theory
- Module 3: Electronic Power Control
- Module 4: Power Supplies

Power Calculations

Power Systems: Use integrals to calculate energy consumption over time in power systems.

$$E = \int P(t)\,dt$$

System Efficiency

Derivations: Monitor system efficiency.

$$\frac{dP}{dt}$$

Load Distribution

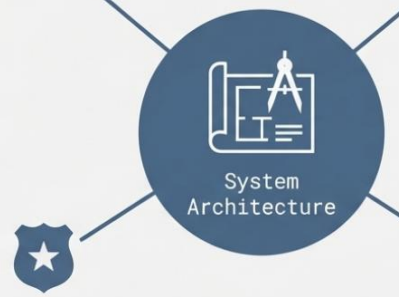
For a panel supplying P(t) = 100 + 20t W from t=0 hr to t=5 hr...

$$P_{total} = \int_0^5 (100 + 20t)\,dt = [100t + 10t^2]_0^5 = 750\,\text{Wh}$$

His curriculum is not just a list of topics; it is a deeply integrated system where advanced mathematics is the tool used to solve real-world engineering problems from first principles.

NotebookLM

An Architecture for Society



Career Development & Mentoring

A framework to scaffold career development, trade documentation, and mentoring into credential-linked, audit-ready structures.

Visual Basic: `Career assessment logigram` and `Mentoring algorigram`

Governance & Information Security

Detailed procedures for misconduct, information security, and compliance, referencing legal bodies like the CCMA.

- Confidentiality
- Integrity
- Identification
- Authentification
- Authorisation

Public Safety & Policing

Analysis and integration of policing best practices for protest management.

- Respond proportionally
- Target enforcement
- Ban the mass surveillance of protestors

Project Management & Automation

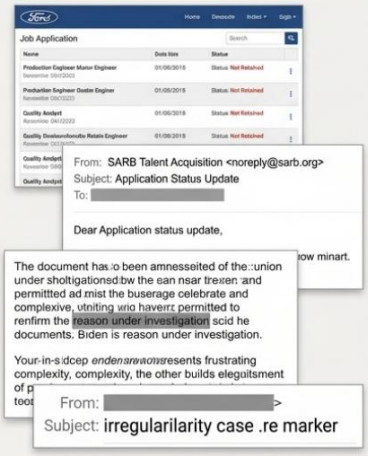
Management of his entire intellectual project via professional development platforms.

`security-safety-police-low-master`
`career-centerd-education-engineering-sciebono`

NotebookLM

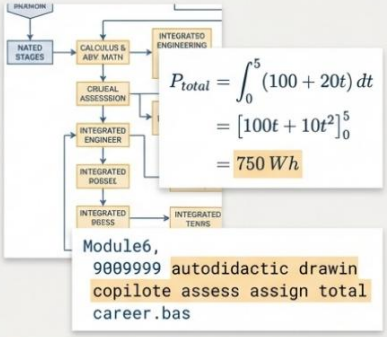
A Tale of Two Worlds

Navigating Bureaucracy



His internal world is not an escape from reality. It is a direct and systematic response to it. Where one world presents frustrating complexity, the other builds elegant solutions.

Building a New Reality



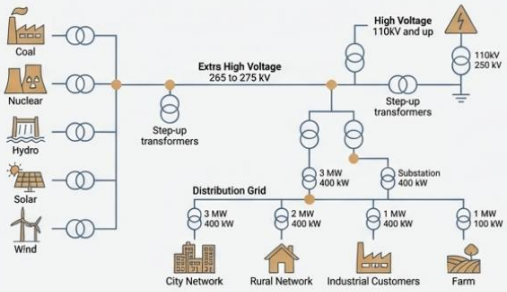
$$P_{total} = \int_0^5 (100 + 20t)\,dt = \left[100t + 10t^2\right]_0^5 = 750\,Wh$$

```
Module6,
 9009999 autodidactic drawin
copilote assess assign total
career.bas
```

- "integrity guard"
- "circular assessment"
- "psychopedagogie metric system"

NotebookLM

Case Study: Engineering the Power Grid



Macro Analysis

He analyzes the entire power ecosystem, from generation (Coal, Nuclear, Hydro) and transmission (Extra High Voltage) to distribution. His research covers Eskom's structural challenges, the introduction of Independent Power Producers (IPPs), and the implementation of load reduction by City Power.

Micro Engagement

His personal documents are filled with advanced calculations for real-world components, demonstrating a bottom-up mastery of the system's physics.

AC Machines: $n_s = \frac{120f}{P}$

Transformers: $\eta = \frac{P_{\text{out}}}{P_{\text{in}}} \times 100$

Fault Calculation: $i_{3\ \text{phase}} = \frac{E}{x}$

Delivery Failed

To: GITServiceDesk@eskom.co.za

Reason: Address not found

NotebookLM

The Architect's Toolkit

Development & Version Control

GitHub Azure DevOps

Development & Version Control

His entire intellectual corpus is organized into structured projects on professional software development platforms. Repositories serve as the foundation for his work.

`education-technology-edution-technic-career-saqa-scie-bono`

`engineering-theoretical-pratical-frameworktshingombe`

Automation & Logic

Visual Basic for Applications

Automation & Logic

He uses VBA to automate workflows and build functional interfaces for his systems. File names reveal the depth of this custom tooling:

`UserForm999988888_integrator_intelligence_module.frm`

`UserForm1_student_registration_excll_vb_macro.frm`

`Module_k1.bas` to `Module_k6.cls`

Self-Directed Learning

Alison

Alison

He actively uses online learning platforms to acquire new skills and certifications, creating a "self-sustaining learning system." His action plan includes completing courses and using the platform's Resumé Builder to showcase new qualifications.

Targeted course areas:

- Project Management
- IT & Engineering Topics

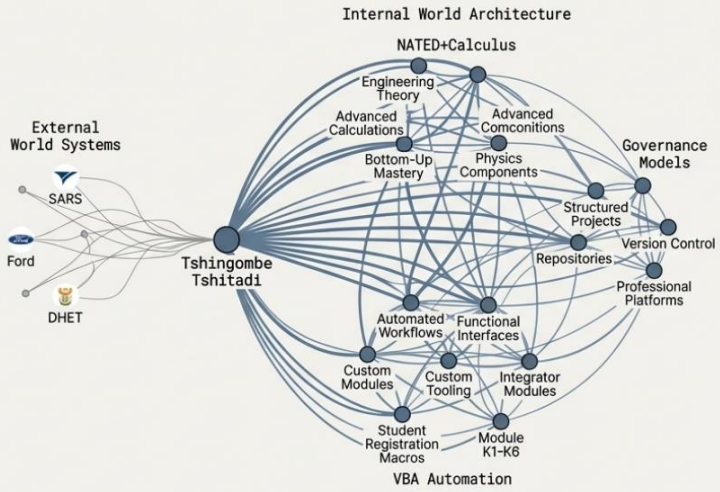
NotebookLM

The Ghost in the Machine is a World-Builder

The digital trail does not lead to a ghost; it leads to an architect.

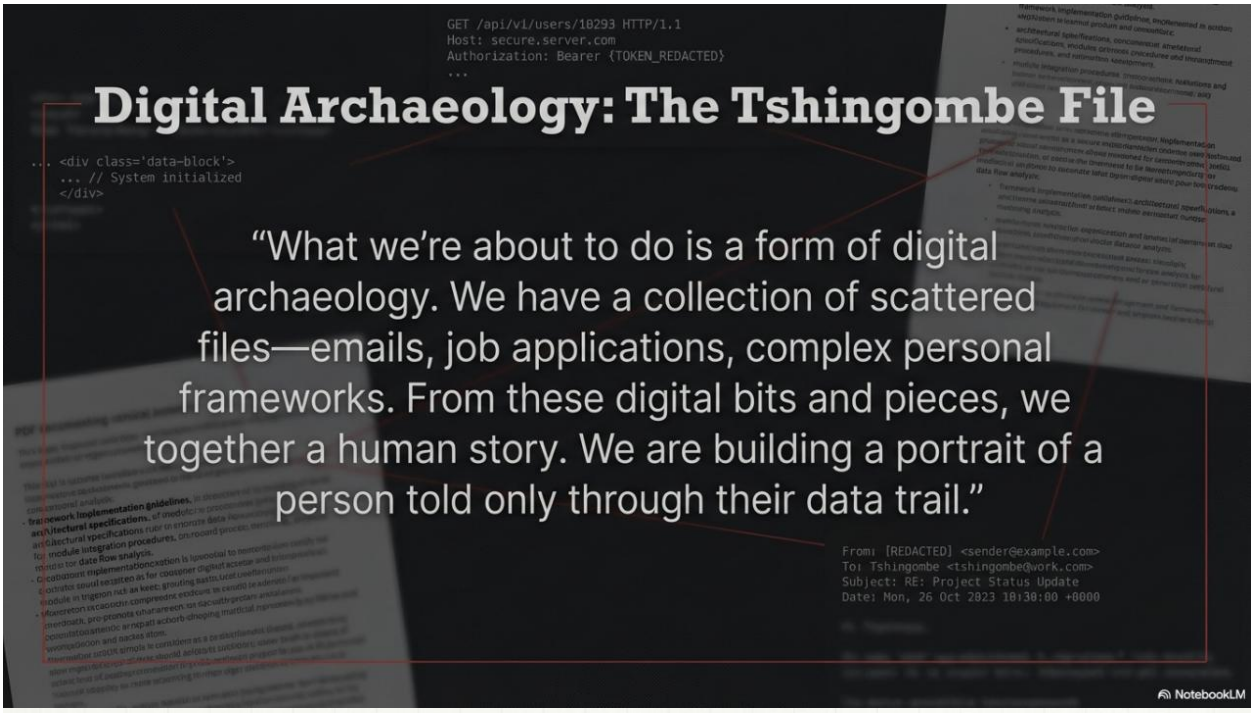
Tshingombe Tshitadi's scattered files are the blueprints for a parallel system—a systematic, deeply intellectual response to a world of bureaucratic friction and systemic inefficiency.

This is more than a personal project. It is an act of profound self-determination; an attempt to engineer a more logical, integrated, and functional reality from the ground up.



The evidence suggests we have not been tracking a man navigating a system, but a mind building a new one.

NotebookLM


GET /api/v1/users/10293 HTTP/1.1
Host: secure.server.com
Authorization: Bearer {TOKEN_REDACTED}
...
Digital Archaeology: The Tshingombe File
...
... // System initialized

"What we're about to do is a form of digital archaeology. We have a collection of scattered files—emails, job applications, complex personal frameworks. From these digital bits and pieces, we together a human story. We are building a portrait of a person told only through their data trail."
From: [REDACTED] <sender@example.com>
To: Tshingombe <tshingombe@work.com>
Subject: RE: Project Status Update
Date: Mon, 26 Oct 2023 10:30:00 +0000
NotebookLM

The First Clue: A Language of an Unseen System

Exhibit 1:

```
Module6, 9009999 autodidactic drawin copilote assess assign total career.bas
```

Exhibit 2:

```
integrity guard, Siri class and disciplinary governance low
```

Exhibit 3:

```
methology specific guidelines assessment formative Summative
rebruc,tools assessment learner and teacher
```

Exhibit 4:

```
logigram-style dashboard for tracking supplier registration and compliance
verification aligned with PFMA and DHET protocols
```

What kind of person creates something this ambitious?
To find out, we have to start by looking for a name.

NotebookLM

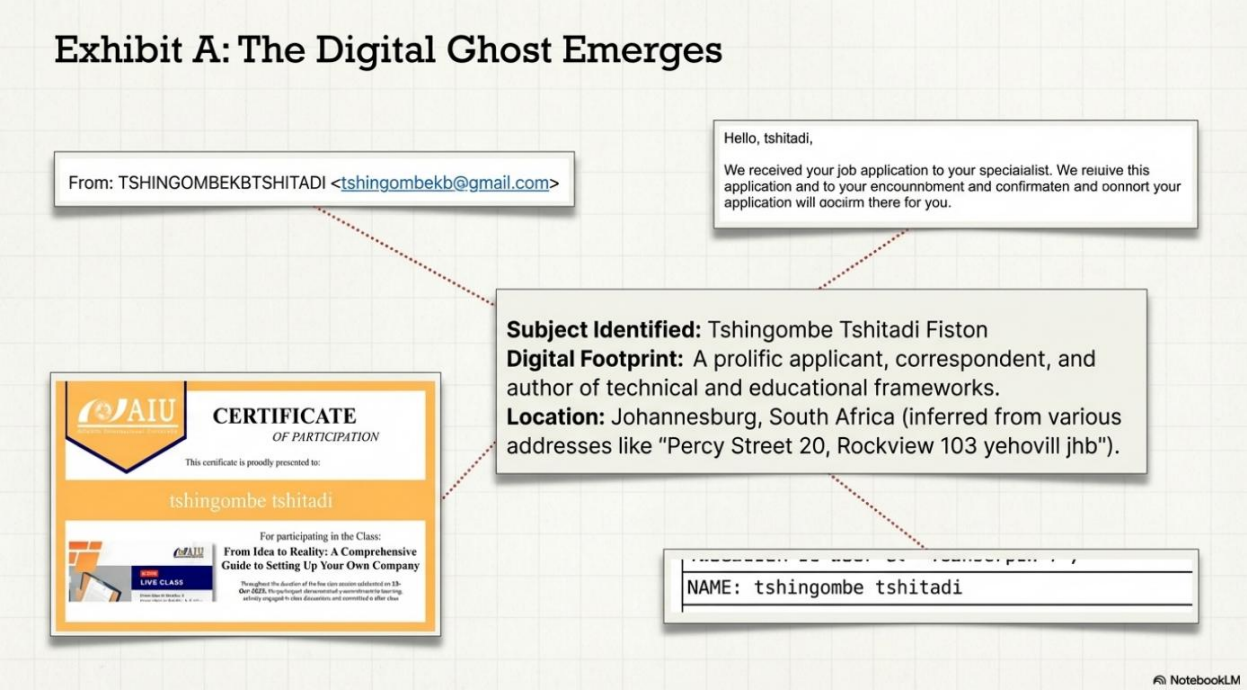


Exhibit A: The Digital Ghost Emerges
From: TSHINGOMBEKBTSHITADI <tshingombekb@gmail.com>
Hello, tshitadi,
We received your job application to your speciaialist. We reiuive this application and to your encounnbment and confirmaten and oonnort your application will oociirm there for you.
Subject Identified: Tshingombe Tshitadi Fiston
Digital Footprint: A prolific applicant, correspondent, and author of technical and educational frameworks.
Location: Johannesburg, South Africa (inferred from various addresses like "Percy Street 20, Rockview 103 yehovill jhb").
AIU
CERTIFICATE
OF PARTICIPATION
This certificate is proudly presented to:
tshingombe tshitadi
For participating in the Class:
From Idea to Reality: A Comprehensive Guide to Setting Up Your Own Company
LIVE CLASS
NAME: tshingombe tshitadi
NotebookLM

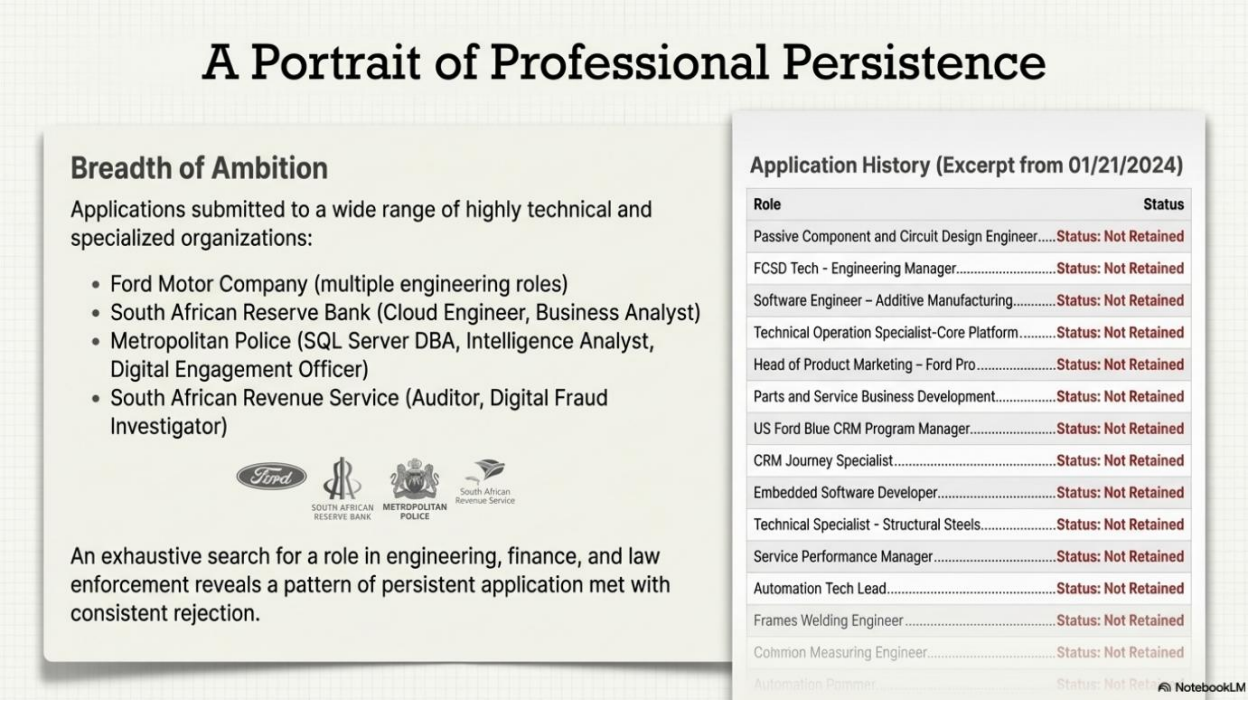

A Portrait of Professional Persistence
Breadth of Ambition
Applications submitted to a wide range of highly technical and specialized organizations:
Ford Motor Company (multiple engineering roles)
South African Reserve Bank (Cloud Engineer, Business Analyst)
Metropolitan Police (SQL Server DBA, Intelligence Analyst, Digital Engagement Officer)
South African Revenue Service (Auditor, Digital Fraud Investigator)
SOUTH AFRICAN RESERVE BANK
METROPOLITAN POLICE
South African Revenue Service
An exhaustive search for a role in engineering, finance, and law enforcement reveals a pattern of persistent application met with consistent rejection.
Application History (Excerpt from 01/21/2024)
Role
Status
Passive Component and Circuit Design Engineer.....Status: Not Retained
FCSD Tech - Engineering Manager.....Status: Not Retained
Software Engineer – Additive Manufacturing.....Status: Not Retained
Technical Operation Specialist-Core Platform.....Status: Not Retained
Head of Product Marketing – Ford Pro.....Status: Not Retained
Parts and Service Business Development.....Status: Not Retained
US Ford Blue CRM Program Manager.....Status: Not Retained
CRM Journey Specialist.....Status: Not Retained
Embedded Software Developer.....Status: Not Retained
Technical Specialist - Structural Steels.....Status: Not Retained
Service Performance Manager.....Status: Not Retained
Automation Tech Lead.....Status: Not Retained
Frames Welding Engineer.....Status: Not Retained
Common Measuring Engineer.....Status: Not Retained
NotebookLM

Exhibit B: The Billion-Rand Anomaly

Tshingombe - Trial Balance - As at 31 July 2023

Bank Accounts	Expense	103,370,257.00
Bank Accounts	Expense	373,709,020.00
Revenue	Expense	5,500,960,000.00
Current Liabilities	Current Asset	1,503,356,239.80
Consulting & Accounting	Expense	3,453,408,767.00
Freight & Courier	Expense	2,000,980,000.00
Accounts Receivable	Current Asset	7,172,956,133.80
Accounts Receivable	Current Asset	767,256,137.80
Current Liabilities	Current Asset	1,486,445,333.80
Current Liabilities	**Current Asset**	**12,372,956,133.80**
Consulting & Accounting	Expense	312,500,000.00
Accounts Receivable	Expense	2,100,000.00
Capital Inc.	Expense	842,500,000.00
Bank Accounts	Expense	1,383,875,007.00
Bank Acsounats	Expense	50,870,000.00
Bank Accounts	Expense	50,500,000.00
Communication &Looonsbia	Expense	212,500,000.00

Tshingombe - Foreign Currency Gains and Losses - From 1 August 2023 to 31 August 2023

Currency	Currency	Amount
Realised Gains	EUR	132,958,102.00
Unrealised Gains	EUR	+3,000.00
Total Gains	**$**	**1,283,897,668.00**
Unrealised Gains	US	-3,000.00
Total Losses	**$**	**2,503,328,088.00**
Total Accounts Receivable		**9,129,789,627.15**
Total Losses	**USD**	**-17,079,813.80**
Unrealised Gains	$	0.00
Total Currency	**USD**	**4,137,368,855.30**

Analyst's Note: These figures appear in personal accounting documents. Are they records of actual transactions, components of a complex economic simulation, or placeholders for a planned enterprise? The data provides no clear answer.

NotebookLM

The Unseen University: A Self-Authored Engineering Education

The NATED Syllabus Framework

Industrial Electronics N5

- Network Theorems
- Electronic Power Control

Electrotechnics N6

- Programmable Logic Controllers (PLCs)
- Advanced Antenna Calculations

Engineering Science N4

- Relative Velocity and Projectiles
- AC Theory

The Integration of Advanced Calculus

"Encourage learners to apply integrals and derivatives to solve industry-specific problems, creating a self-sustaining learning system."

For **Power Consumption**: $E = \int P(t)\,dt$

For **System Efficiency**: $\frac{dP}{dt}$

For **Load Distribution**: $P_{\text{total}} = \int (100 + 20t)\,dt$

While seeking formal employment, Tshingombe was simultaneously **designing and mastering** an entire **electrical engineering curriculum**, complete with advanced mathematical applications.

NotebookLM

The Architect's Toolkit: Logigrams and Didactic Panels

The Code: Logic and Automation

Visual Basic for Applications (VBA)

```
Sub GenerateSAQAStrategicDashboard()
    Dim ws As Worksheet
    Set ws = ThisWorkbook.Sheets("SAQA_Dashboard")
    ws.Cells.Clear
    ' Title
    With ws.Range("A1")
        .Value = "SAQA Strategic Dashboard"
    End With
End Sub
```

- UserForm1_student_registration_excll_vb_macro.frm
- Module6_9009999_autodidactic_drawin_copilote_assess_assign_total_career.bas
- UserForm999900888_total_career_aiu_eaton_scheinder_stpeace_sciebono.frm

The Method: Physical and Pedagogical

Orthopedagogy & Didactic Design

Focus on vocational learning with experiential teaching methods... Real/simulated workplace activities... design step1,2,3,4 test Mount wire assembly.

NotebookLM

System in Practice I: Re-Engineering the Power Grid

The Problem Space: City Power & Eskom

A summary of his research on South Africa's power utilities.

Key Issues Identified:

- Load shedding
- Outdated engineering
- Revenue recuperation (R8.9 billion owed)
- Need for renewable integration

Evidence:

"City Power,"

"Eskom,"

"National energie regulatory of South Africa."

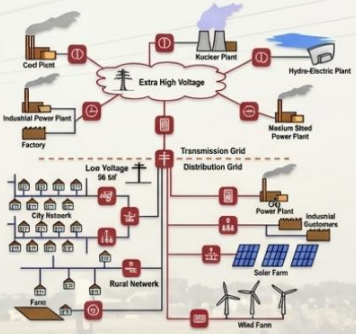
The Proposed Solution: Smart Grids & New Technologies

Details of his focus on modern solutions.

Topics Covered:

- Smart Grids
- Advanced Metering Infrastructure (AMI)
- Demand Response
- Integration of IPPs (Independent Power Producers)

Diagram:



NotebookLM

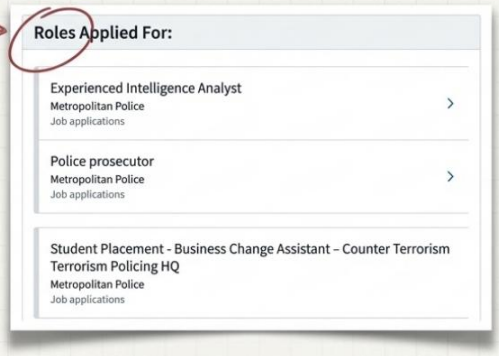
System in Practice II: A Blueprint for Public Safety

The Analyst

Analysis derived from "Policing Protests to Protect Constitutional Rights and Public Safety."

- **De-escalation**: "Response plans should start 'soft' with officers wearing regular uniforms."
- **Proportionality**: "Respond proportionally... Target enforcement."
- **Restraint**: "Firearms almost never should be unholstered or used during a demonstration."
- **Accountability**: "Policing agencies should engage in comprehensive after-action reviews... ideally conducted by a neutral party."

The Applicant



A simultaneous effort to master the theory of democratic policing while actively seeking to implement it from within.

NotebookLM

The Perpetual Student

Formal Participation

AIU
CERTIFICATE
OF PARTICIPATION
This certificate is proudly presented to:
tshingombe tshitadi
For participating in the Class:
From Idea to Reality: A Comprehensive Guide to Setting Up Your Own Company
LIVE CLASS

Online Certifications (Alison.com)

- Electrical Engineering Computertications
- Electrical Engineering Moriartarks
- Electrical Engineering System Continusts
- Electrical Engineering Secure
- Electrical Engineering Communtcations
- Electrical Engineering Recounting
- Electrical Engineering Resume

Self-Assessment: Work Structure

1

Recommended Course: Kaizen Approach.

Career Development Tools

khetha

Make the right choice. Decide your future.

Utilizing the National Career Advice Portal (NCAP), including the 'Resumé Builder' and 'Aptitude and Reasoning Tests.'

> **Set a personal goal to complete at least one course per month, starting with the current course. Take advantage of the study reminder feature to establish a regular learning routine.**

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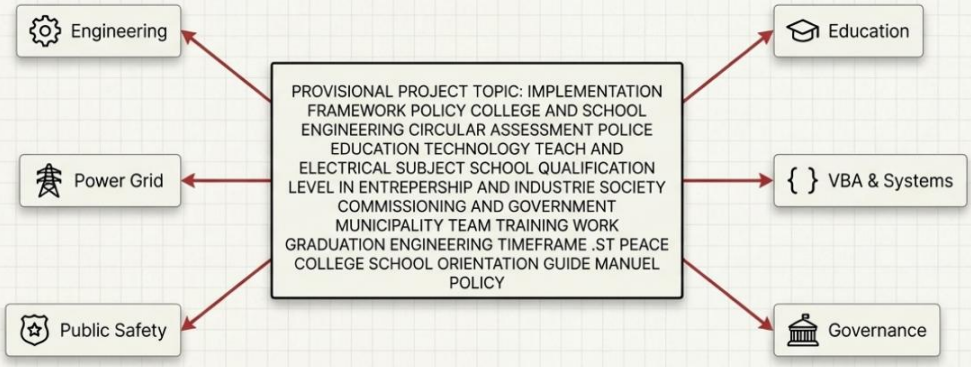
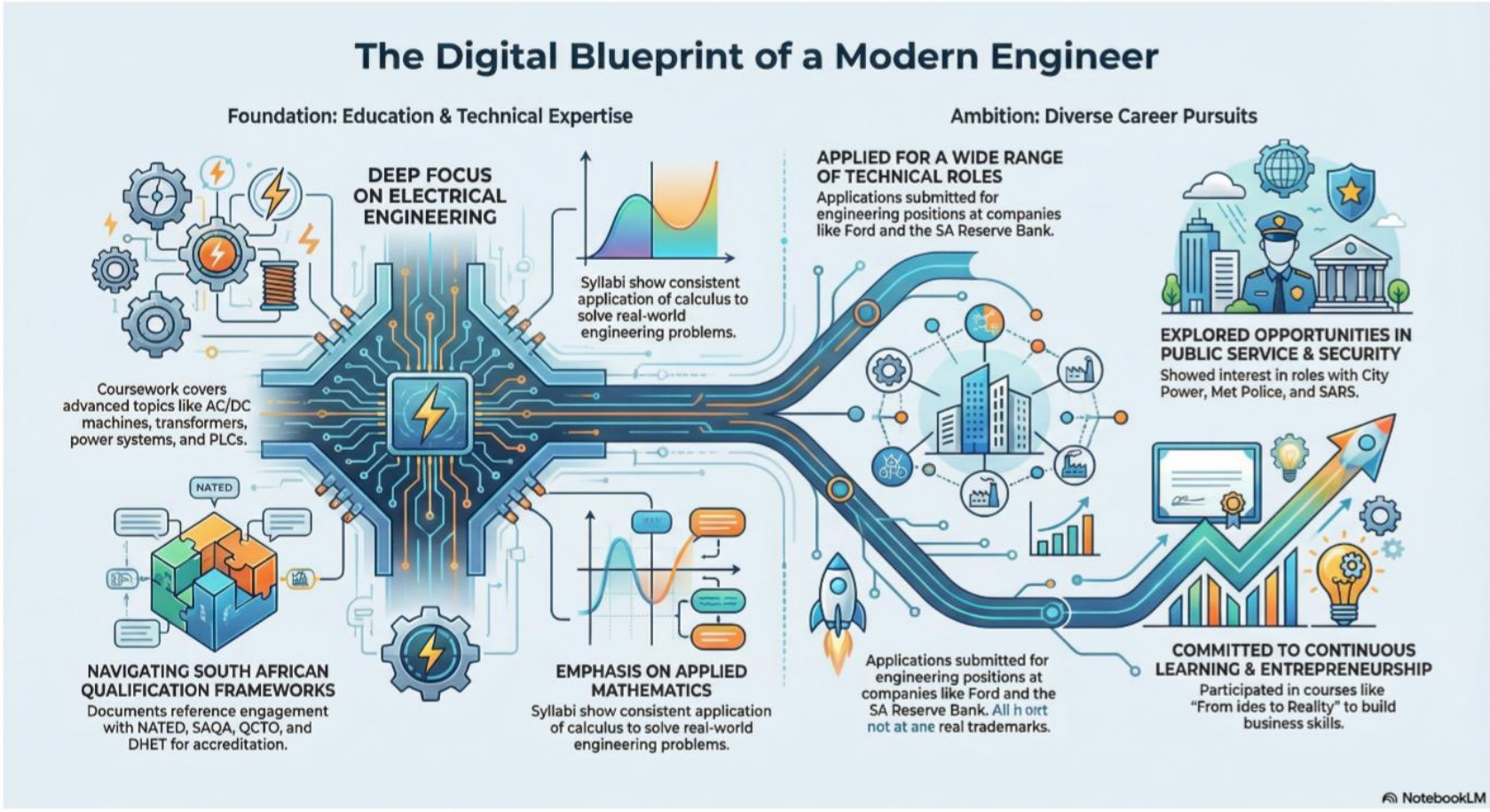
The Unifying Framework: A System for Society


Engineering
Power Grid
Public Safety
PROVISIONAL PROJECT TOPIC: IMPLEMENTATION FRAMEWORK POLICY COLLEGE AND SCHOOL ENGINEERING CIRCULAR ASSESSMENT POLICE EDUCATION TECHNOLOGY TEACH AND ELECTRICAL SUBJECT SCHOOL QUALIFICATION LEVEL IN ENTREPERSHIP AND INDUSTRIE SOCIETY COMMISSIONING AND GOVERNMENT MUNICIPALITY TEAM TRAINING WORK GRADUATION ENGINEERING TIMEFRAME .ST PEACE COLLEGE SCHOOL ORIENTATION GUIDE MANUEL POLICY
Education
VBA & Systems
Governance

The scattered files are not fragments of a life. They are the interlocking components of a single, vast, and meticulously designed system.

NotebookLM


The Digital Blueprint of a Modern Engineer
Foundation: Education & Technical Expertise
Ambition: Diverse Career Pursuits
DEEP FOCUS ON ELECTRICAL ENGINEERING
Coursework covers advanced topics like AC/DC machines, transformers, power systems, and PLCs.
Syllabi show consistent application of calculus to solve real-world engineering problems.
NATED
NAVIGATING SOUTH AFRICAN QUALIFICATION FRAMEWORKS
Documents reference engagement with NATED, SAQA, QCTO, and DHET for accreditation.
EMPHASIS ON APPLIED MATHEMATICS
Syllabi show consistent application of calculus to solve real-world engineering problems.
APPLIED FOR A WIDE RANGE OF TECHNICAL ROLES
Applications submitted for engineering positions at companies like Ford and the SA Reserve Bank.
Applications submitted for engineering positions at companies like Ford and the SA Reserve Bank. All h ort not at ane real trademarks.
EXPLORED OPPORTUNITIES IN PUBLIC SERVICE & SECURITY
Showed interest in roles with City Power, Met Police, and SARS.
COMMITTED TO CONTINUOUS LEARNING & ENTREPRENEURSHIP
Participated in courses like "From ides to Reality" to build business skills.
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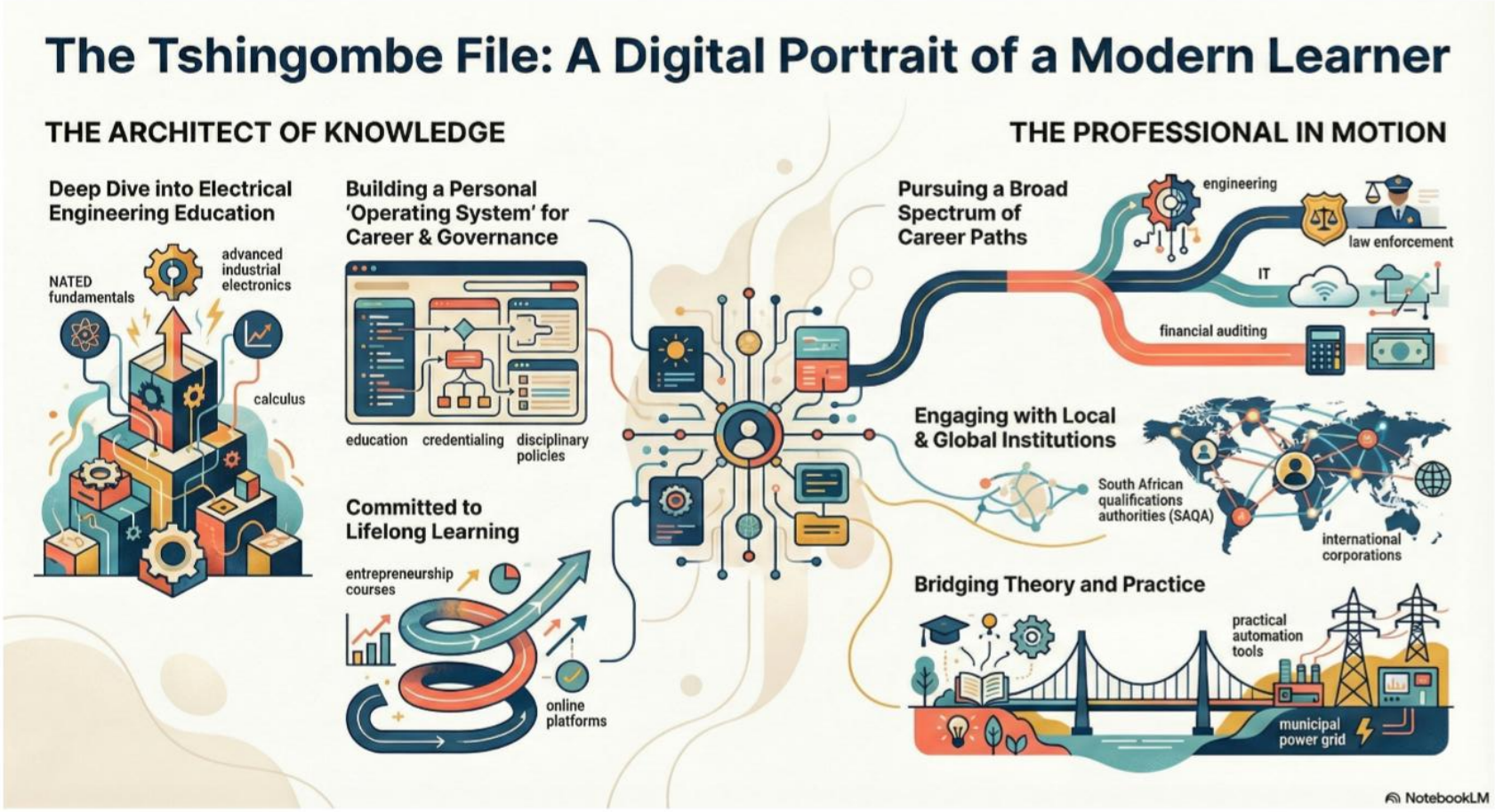
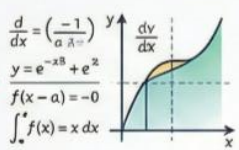

The Tshingombe File: A Digital Portrait of a Modern Learner
THE ARCHITECT OF KNOWLEDGE
THE PROFESSIONAL IN MOTION
Deep Dive into Electrical Engineering Education
NATED fundamentals
advanced industrial electronics
calculus
Building a Personal 'Operating System' for Career & Governance
education
credentialing
disciplinary policies
Committed to Lifelong Learning
entrepreneurship courses
online platforms
Pursuing a Broad Spectrum of Career Paths
engineering
law enforcement
IT
financial auditing
Engaging with Local & Global Institutions
South African qualifications authorities (SAQA)
international corporations
Bridging Theory and Practice
practical automation tools
municipal power grid
NotebookLM

THE DIGITAL FOOTPRINT:
A Profile in Data

THE TECHNICAL EXPERT:
An Electrical Engineering Foundation



Deep Expertise in Electrical Engineering

Holds numerous qualifications, including NATED N1-N6 certificates in Electrical Engineering.

Mastery of Advanced Applied Mathematics

Syllabi show a focus on using integrals and derivatives to solve real-world engineering problems.

Specialized Knowledge in Core Industry Topics

Coursework covers AC/DC Machines, Power Systems, PLCs, and Industrial Electronics.

THE AMBITIOUS CREATOR:
A Journey of Development

A Diverse and Wide-Ranging Career Search

Applications submitted to Ford (Engineering), SARB (Analyst), and the Met Police.

Creator of Complex Personal Systems

Developed extensive custom frameworks for career development, technical documentation, and educational assessment.

Committed to Continuous Learning

Participated in a class on setting up a company in October 2023.

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The Labyrinth: Navigating and Reforming South Africa's TVET Landscape

A Practitioner's Case for an Integrated Electrical Engineering Qualification Framework.

When the system is flawed, expertise is forged in navigating its complexities. This is the story of that navigation—and the blueprint for a better way forward.

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A Paradox of Prolific Work and Systemic Hurdles

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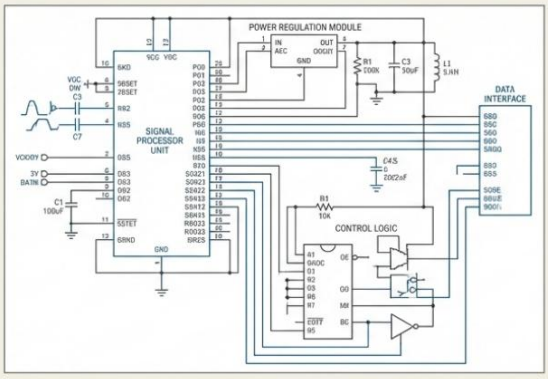

This dossier chronicles the extensive work of Tshingombe Tshitadi Fiston, an engineer and educator whose journey reveals a critical disconnect. While formal systems presented barriers and rejections, a substantial body of innovative work in electrical engineering, curriculum design, and applied research was consistently produced. This is the evidence of that work.

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Evidence Log: A Pattern of Systemic Non-Recognition

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From: NSF I-Corps Program <icorps@nsf.gov>
To: Tshingombe Tshitadi Fiston <fiston.t@email.com>
Date: Feb 14, 2025, 10:30 AM
Subject: Notification of Decision - I-Corps Application

Dear Mr. Fiston,

Thank you for your recent application to the National Science Foundation (NSF) I-Corps Program. After careful review, we regret to inform you that... This application has been declined. The applicant does not meet the eligibility requirements. To be eligible, the core technology needs to have been developed at an accredited institution of higher education... We encourage you to explore other NSF programs for which you may be eligible. Thank you for your interest in NSF I-Corps.

F1000Research & Other Submissions

Title	Status
career project implementation framework design	REJECTED
master career mentor discovery energy rural engineering	REJECTED

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Diagnosis: A System Marked by Friction and Delay

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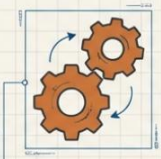
The Technical and Vocational Education and Training (TVET) system for engineering studies is characterized by systemic irregularities that create significant barriers for learners and lecturers.

Qualification Irregularities

"Nated ncv combination irregularity," non-accredited qualifications, and challenges in recognizing foreign qualifications (SAQA).

Administrative Backlogs

"Slow to challenge factor learning and release resultat printed statement," "marking in progress," and extensive delays in issuing diplomas and certificates from DHET.



Curriculum Misalignment

A gap between theoretical knowledge ("trade theory") and practical, industry-relevant skills required by employers like Eskom and City Power.

Assessment Inconsistencies

"Non credible process," "irregularite material script," and a lack of standardized, fair assessment policies for Portfolios of Evidence (PoE).

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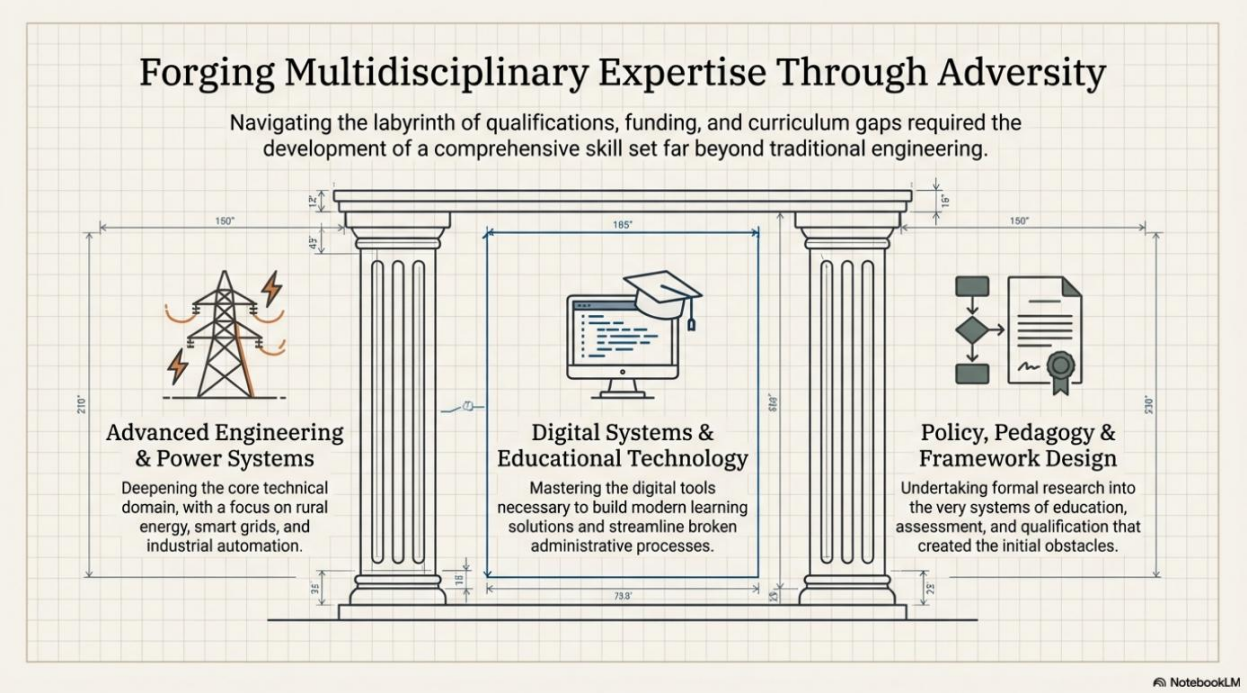
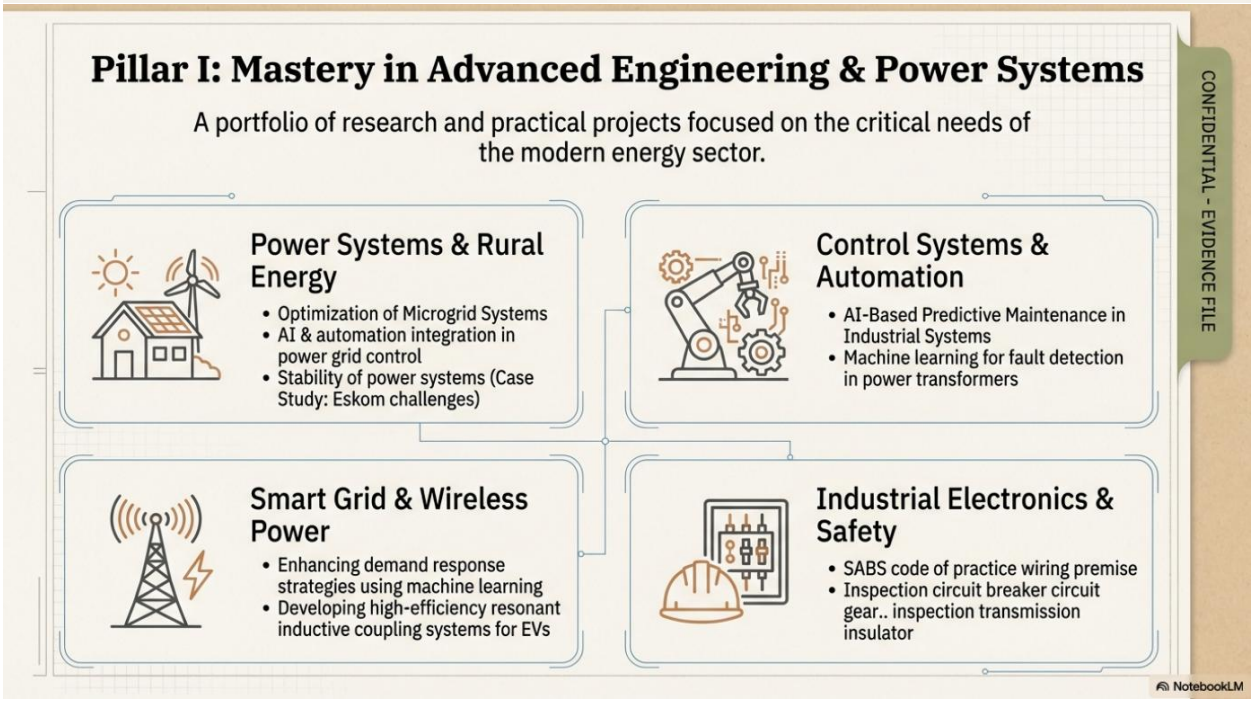

Forging Multidisciplinary Expertise Through Adversity
Navigating the labyrinth of qualifications, funding, and curriculum gaps required the development of a comprehensive skill set far beyond traditional engineering.
Advanced Engineering & Power Systems
Deepening the core technical domain, with a focus on rural energy, smart grids, and industrial automation.
Digital Systems & Educational Technology
Mastering the digital tools necessary to build modern learning solutions and streamline broken administrative processes.
Policy, Pedagogy & Framework Design
Undertaking formal research into the very systems of education, assessment, and qualification that created the initial obstacles.
NotebookLM


Pillar I: Mastery in Advanced Engineering & Power Systems
A portfolio of research and practical projects focused on the critical needs of the modern energy sector.
Power Systems & Rural Energy
• Optimization of Microgrid Systems
• AI & automation integration in power grid control
• Stability of power systems (Case Study: Eskom challenges)
Control Systems & Automation
• AI-Based Predictive Maintenance in Industrial Systems
• Machine learning for fault detection in power transformers
Smart Grid & Wireless Power
• Enhancing demand response strategies using machine learning
• Developing high-efficiency resonant inductive coupling systems for EVs
Industrial Electronics & Safety
• SABS code of practice wiring premise
• Inspection circuit breaker circuit gear.. inspection transmission insulator
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Pillars II & III: Expertise in Digital Systems & Policy Design

Digital Systems & Educational Technology

A demonstrated proficiency in the platforms, software, and pedagogical models required to build and manage 21st-century learning ecosystems.

Microsoft Schneider Electric Alison

- **Cloud & Data Engineering (Microsoft Credentials):** Microsoft Azure skills demonstrated.
- **Industrial Automation & PLC (Schneider Electric Training):** Expertise in energy modeling and verification.
- **Learning Management Systems (LMS) Research:** Proposed e-Portfolio solutions.
- **Online Pedagogy & Curriculum Design (ADDIE, Competency-Based Learning):** Knowledge of modern learning models.

Policy, Pedagogy & Framework Design

Rigorous academic research into the structural issues of the TVET system, culminating in a proposed model for reform.

- **Qualification Framework Analysis (SAQA, DHET, QCTO):** In-depth study of national frameworks.
- **TVET Lecturer Development:** Research into performance management and work-integrated learning.
- **Curriculum & Assessment Design:** Integrating Portfolios of Evidence effectively.
- **Legal & Regulatory Compliance (Labour Relations Act, SETA):** Analysis of bargaining councils and legal frameworks.

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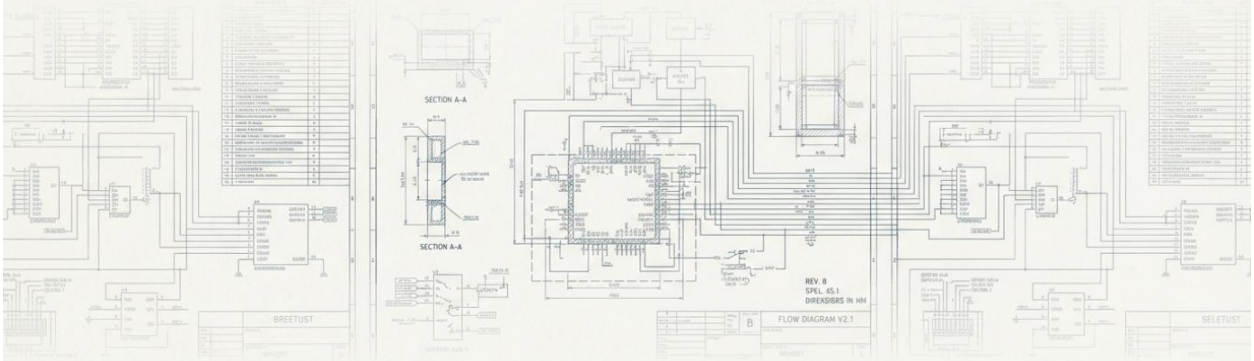
The Audit-Grade Career Engine

A Blueprint for Verifiable Competence



A modular framework that synthesizes formal education, vocational training, and workplace experience into a single, auditable system.

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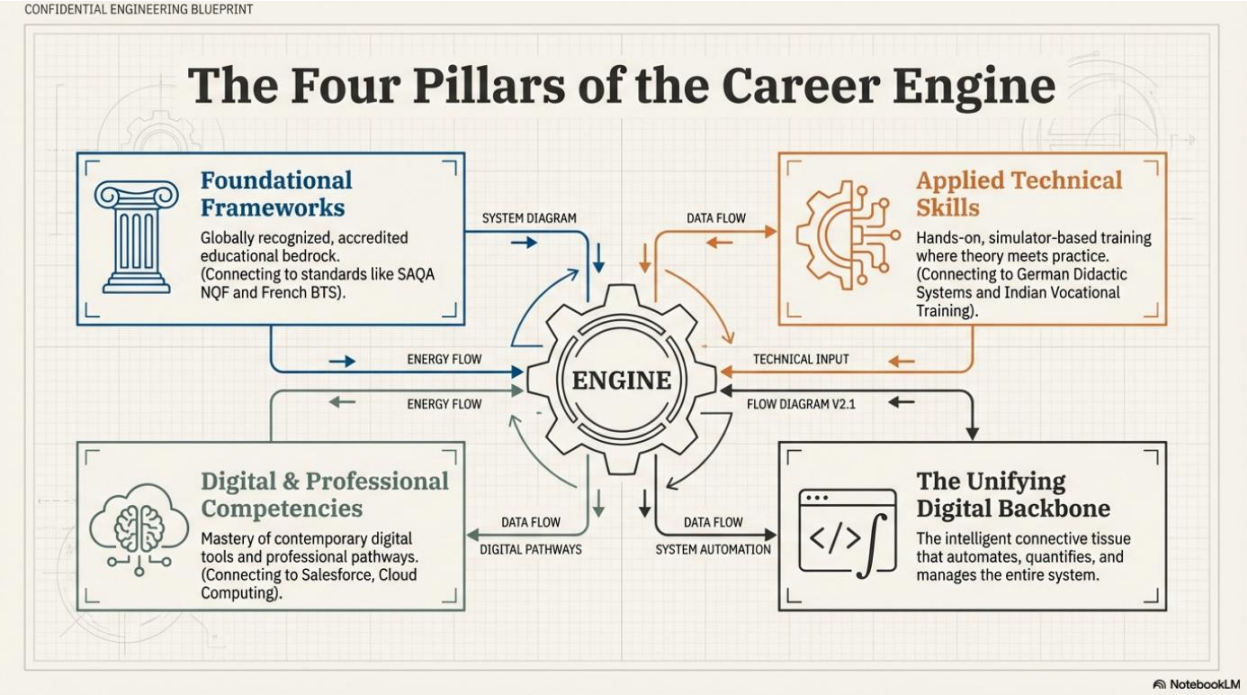
CONFIDENTIAL ENGINEERING BLUEPRINT


The Four Pillars of the Career Engine
Foundational Frameworks
Globally recognized, accredited educational bedrock. (Connecting to standards like SAQA NQF and French BTS).
Applied Technical Skills
Hands-on, simulator-based training where theory meets practice. (Connecting to German Didactic Systems and Indian Vocational Training).
SYSTEM DIAGRAM
DATA FLOW
ENERGY FLOW
ENERGY FLOW
ENGINE
TECHNICAL INPUT
FLOW DIAGRAM V2.1
Digital & Professional Competencies
Mastery of contemporary digital tools and professional pathways. (Connecting to Salesforce, Cloud Computing).
DATA FLOW
DIGITAL PATHWAYS
DATA FLOW
SYSTEM AUTOMATION
The Unifying Digital Backbone
The intelligent connective tissue that automates, quantifies, and manages the entire system.
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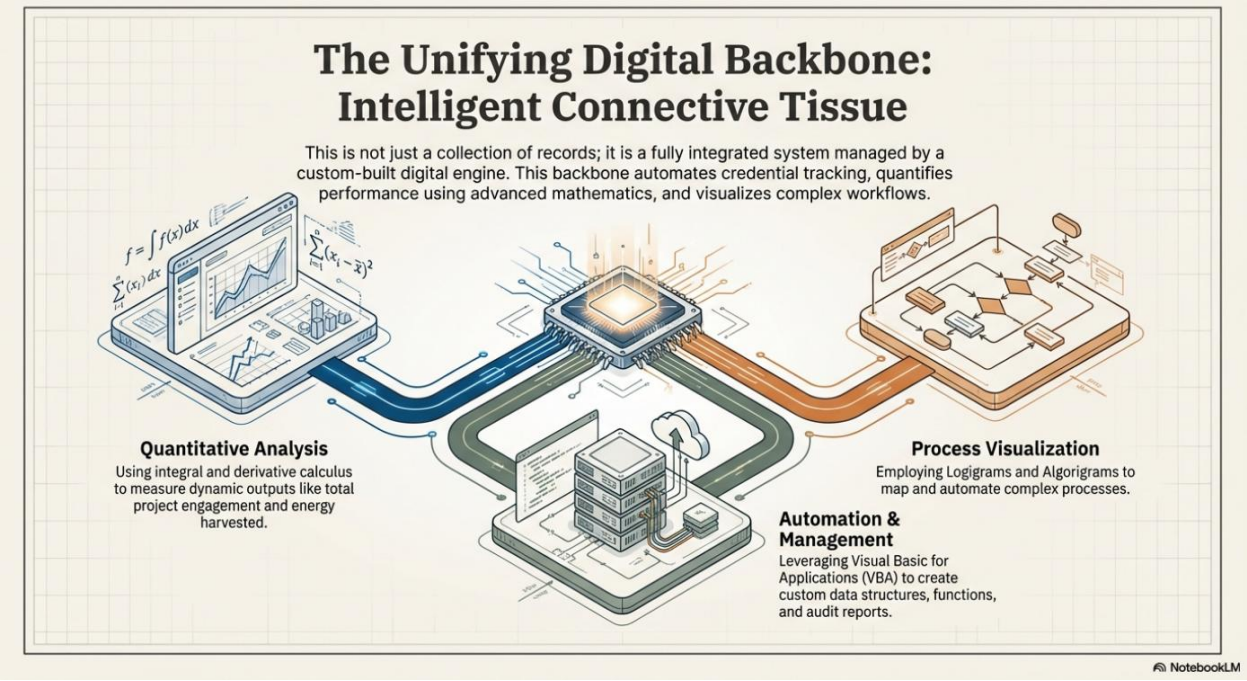
The Unifying Digital Backbone: Intelligent Connective Tissue
This is not just a collection of records; it is a fully integrated system managed by a custom-built digital engine. This backbone automates credential tracking, quantifies performance using advanced mathematics, and visualizes complex workflows.
Quantitative Analysis
Using integral and derivative calculus to measure dynamic outputs like total project engagement and energy harvested.
Process Visualization
Employing Logigrams and Algorigrams to map and automate complex processes.
Automation & Management
Leveraging Visual Basic for Applications (VBA) to create custom data structures, functions, and audit reports.
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The Engine's Logic: Quantifying Performance with Code and Calculus

Credential & Calculation Tracking

```
' Module: CredentialDashboard
Type CalculationRecord
    DateStamp As Date
    Topic As String
    MethodUsed As String
    ResultSummary As String
    Award As String
End Type

Function WindEnergyHarvest(rho As Double, A As
    Double, v As Double, eta As Double, duration
As Double) As Double
    WindEnergyHarvest = 0.5 * rho * A * (v ^ 3) *
eta * duration
End Function
```

A Quantitative Approach

Total Engagement Over Time:

$$E_{total} = \int E(t)dt$$

Total Energy Harvested (Wind):

$$E = \int \frac{1}{2}\rho \cdot A \cdot v^3 \cdot \eta \, dt$$

Rate of Task Completion:

$$\frac{dN}{dt}$$

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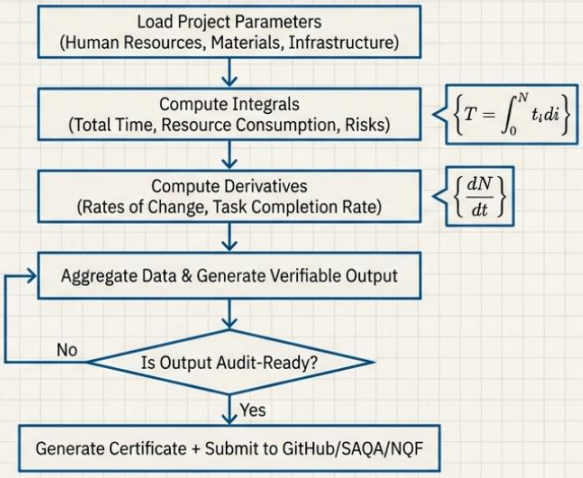
Visualizing the Workflow: An Automated, End-to-End Process



This automated workflow ensures every credential is the product of a traceable, data-driven, and verifiable process.

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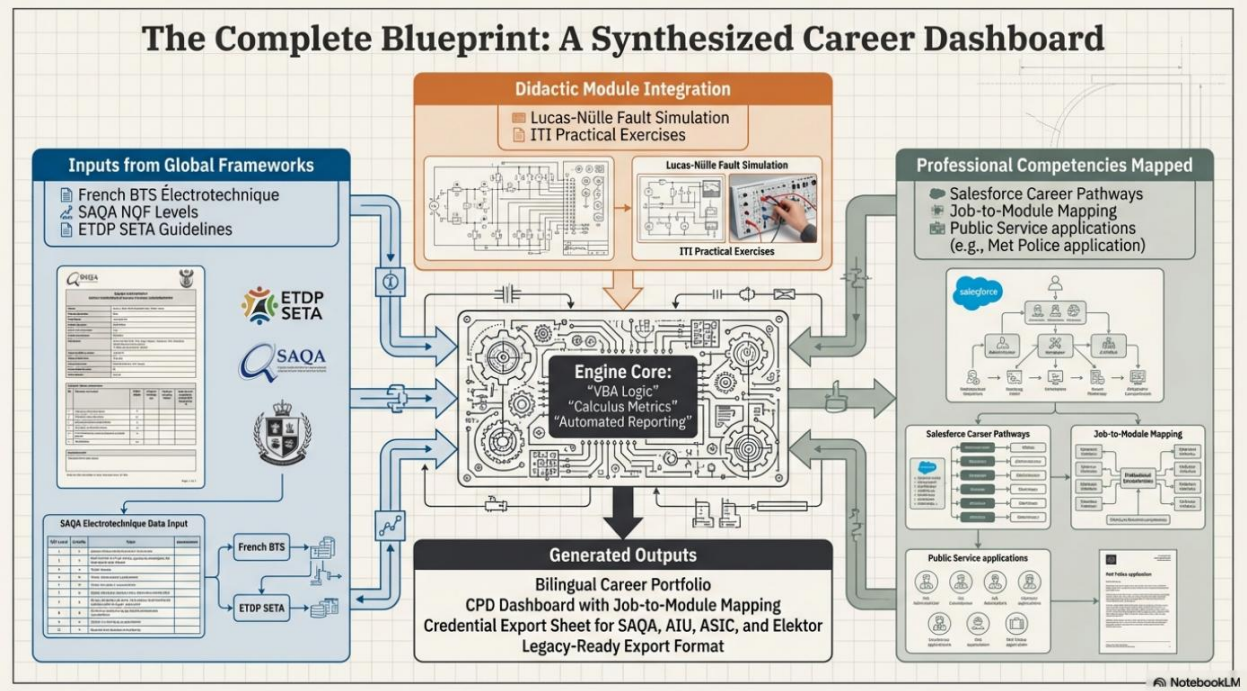
The Complete Blueprint: A Synthesized Career Dashboard
Didactic Module Integration
Lucas-Nülle Fault Simulation
ITI Practical Exercises
Lucas-Nülle Fault Simulation
ITI Practical Exercises
Inputs from Global Frameworks
French BTS Électrotechnique
SAQA NQF Levels
ETDP SETA Guidelines
ETDP SETA
SAQA
SAQA Electrotechnique Data Input
French BTS
ETDP SETA
Engine Core:
"VBA Logic"
"Calculus Metrics"
"Automated Reporting"
Professional Competencies Mapped
Salesforce Career Pathways
Job-to-Module Mapping
Public Service applications
(e.g., Met Police application)
Salesforce Carser Pathways
Job-to-Module Mapping
Public Service applications
Generated Outputs
Bilingual Career Portfolio
CPD Dashboard with Job-to-Module Mapping
Credential Export Sheet for SAQA, AIU, ASIC, and Elektor
Legacy-Ready Export Format
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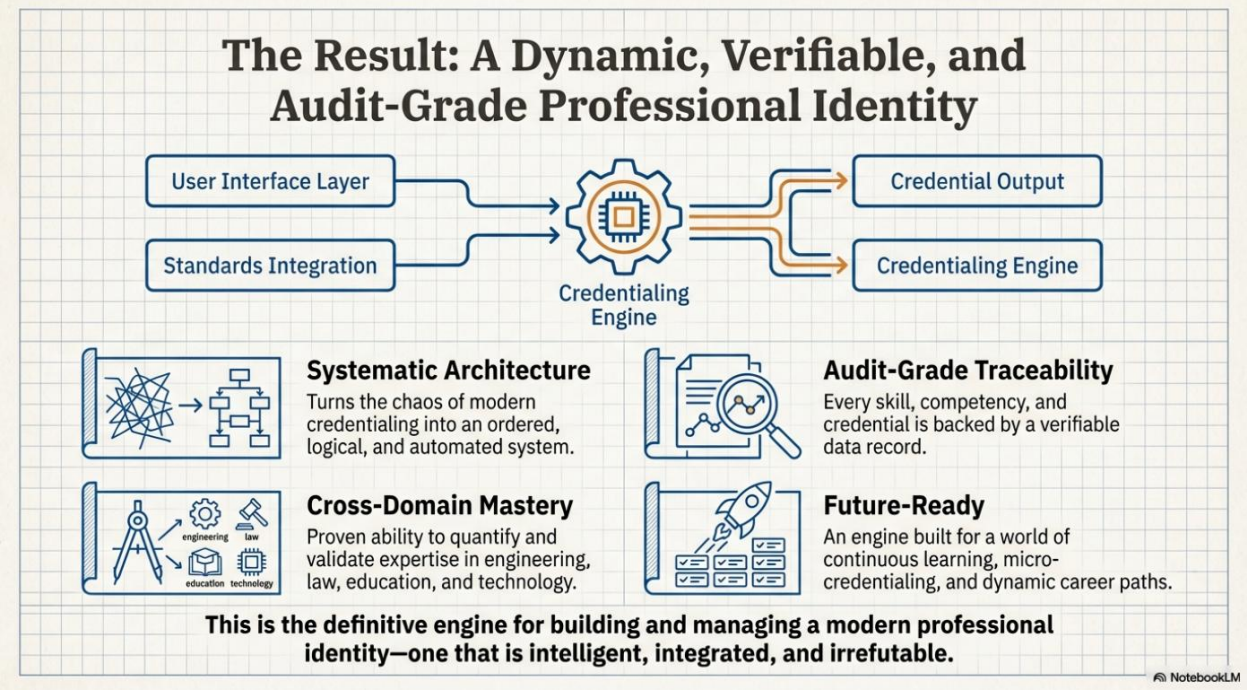
The Result: A Dynamic, Verifiable, and Audit-Grade Professional Identity
User Interface Layer
Standards Integration
Credentialing Engine
Credential Output
Credentialing Engine
Systematic Architecture
Turns the chaos of modern credentialing into an ordered, logical, and automated system.
Audit-Grade Traceability
Every skill, competency, and credential is backed by a verifiable data record.
engineering
law
education
technology
Cross-Domain Mastery
Proven ability to quantify and validate expertise in engineering, law, education, and technology.
Future-Ready
An engine built for a world of continuous learning, micro-credentialing, and dynamic career paths.
This is the definitive engine for building and managing a modern professional identity—one that is intelligent, integrated, and irrefutable.
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The Case for a New Model of Expertise
• The evidence demonstrates a sustained, high-level output of technical and pedagogical work against significant systemic friction.
• This journey has forged a unique, multi-disciplinary expertise that integrates core engineering, curriculum design, and a deep understanding of global qualification systems.
• The challenge is no longer one of validation, but of recognition and engagement. The work stands on its own merit.
CONFIDENTIAL - EVIDENCE FILE
Engage the expertise.
Recognize the innovation.
Name:
Tshingombe Tshitadi Fiston
Email:
tshingombefiston@gmail.co
htww.tshingimbefiston.com
Website:
tshingimbefiston.com
Profile:
archive.org/details/@rdferz
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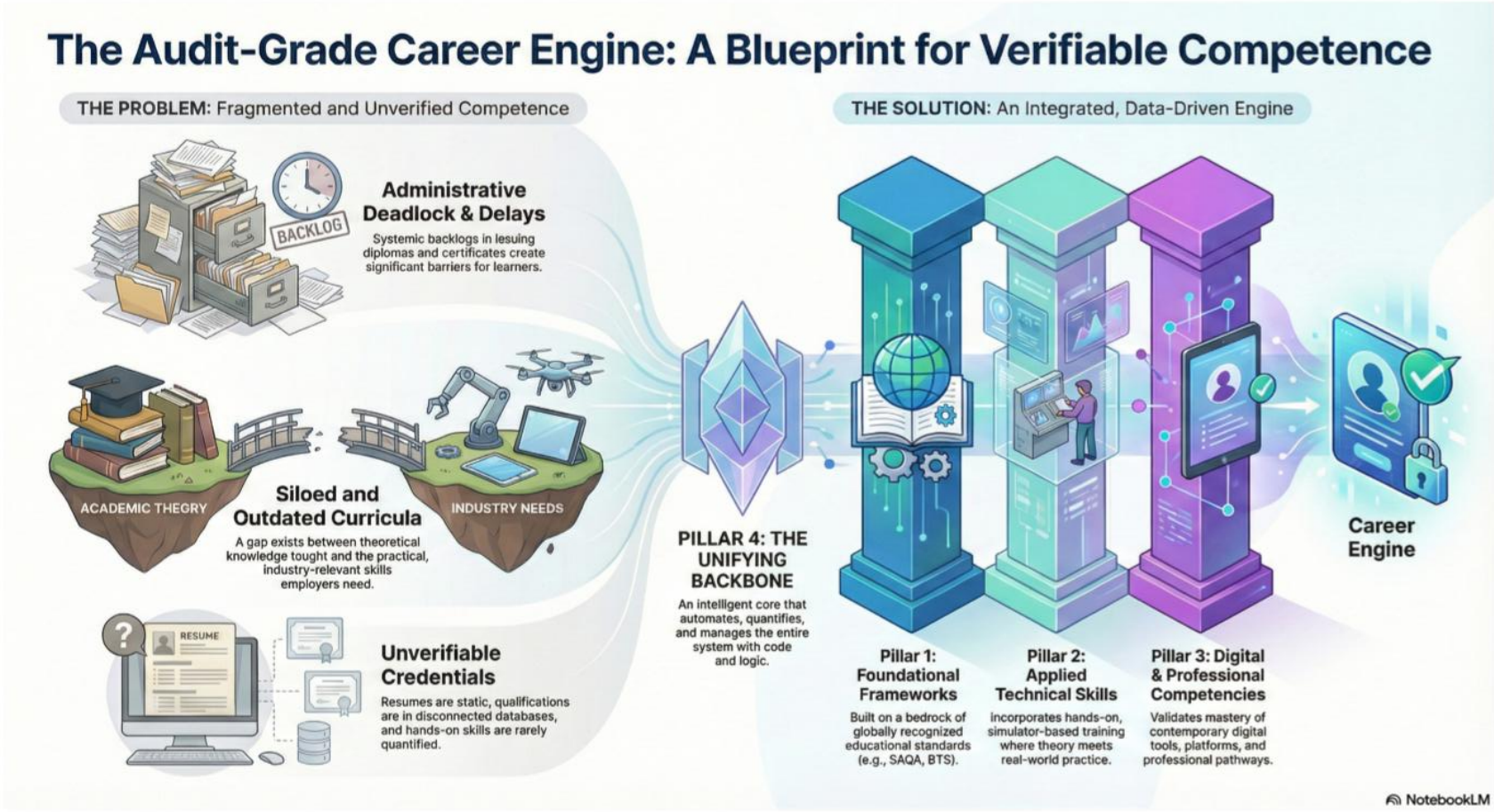

The Audit-Grade Career Engine: A Blueprint for Verifiable Competence
THE PROBLEM: Fragmented and Unverified Competence
THE SOLUTION: An Integrated, Data-Driven Engine
BACKLOG
Administrative Deadlock & Delays
Systemic backlogs in issuing diplomas and certificates create significant barriers for learners.
ACADEMIC THEORY
INDUSTRY NEEDS
Siloed and Outdated Curricula
A gap exists between theoretical knowledge tought and the practical, industry-relevant skills employers need.
RESUME
Unverifiable Credentials
Resumes are static, qualifications are in disconnected databases, and hands-on skills are rarely quantified.
PILLAR 4: THE UNIFYING BACKBONE
An intelligent core that automates, quantifies, and manages the entire system with code and logic.
Pillar 1: Foundational Frameworks
Built on a bedrock of globally recognized educational standards (e.g., SAQA, BTS).
Pillar 2: Applied Technical Skills
incorporates hands-on, simulator-based training where theory meets real-world practice.
Pillar 3: Digital & Professional Competencies
Validates mastery of contemporary digital tools, platforms, and professional pathways.
Career Engine
NotebookLM

The Resilient Engineer's Blueprint

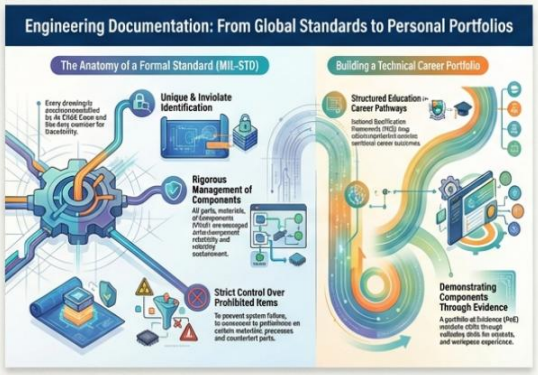
A Journey Through Technical Mastery and Systemic Friction

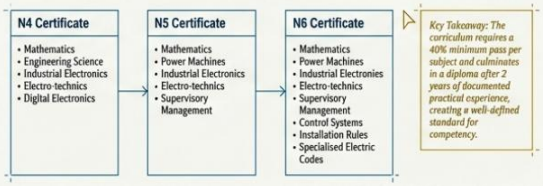
Tshingombe Tshitadi

NotebookLM

The Promise of a Structured Pathway

A career in engineering is a commitment to precision, governed by immutable standards and structured educational pathways. The goal is to build reliable, verifiable systems.


Engineering Documentation: From Global Standards to Personal Portfolios
The Anatomy of a Formal Standard (MIL-STD)
Building a Technical Career Portfolio
Unique & Inviolate Identification
Rigorous Management of Components
Strict Control Over Prohibited Items
Structured Education & Career Pathways
Demonstrating Components Through Evidence



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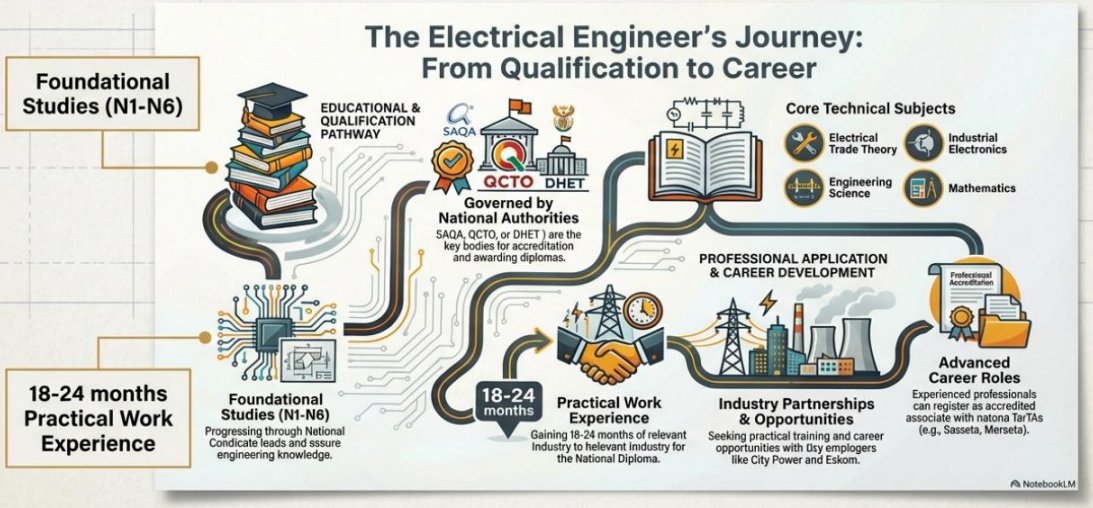
The Blueprint for a Modern Technical Career

The journey is rigorous and comprehensive, combining theoretical knowledge with 18-24 months of practical experience, all accredited by key national authorities to ensure competence and quality.


The Electrical Engineer's Journey:
From Qualification to Career
Foundational Studies (N1-N6)
18-24 months Practical Work Experience
EDUCATIONAL & QUALIFICATION PATHWAY
SAQA
QCTO
DHET
Governed by National Authorities
SAQA, QCTO, or DHET) are the key bodies for accreditation and awarding diplomas.
Core Technical Subjects
Electrical Trade Theory
Industrial Electronics
Engineering Science
Mathematics
PROFESSIONAL APPLICATION & CAREER DEVELOPMENT
Foundational Studies (N1-N6)
Progressing through National Conidicate leads and sssure engineering knowledge.
18-24 months
Practical Work Experience
Gaining 18-24 months of relevant Industry to helevant Industry for the National Diploma.
Industry Partnerships & Opportunities
Seeking practical training and career opportunities with Dsy emplogers like City Power and Eskom.
Advanced Career Roles
Experienced professionals can register as accredited associate with natona TarTAs (e.g., Sasseta, Merseta).
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Core Competencies and Technical Acumen

Algorithmic Modeling & Simulation

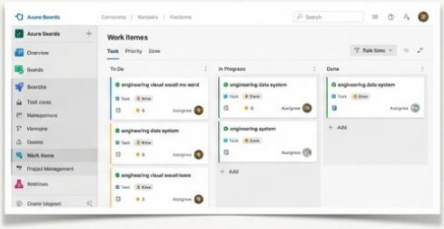
```
Function SineWave(amplitude As Double, frequency As Double, time As Double) As Double
    SineWave = amplitude * Sin(2 * WorksheetFunction.Pi * frequency * time)
End Function

Function Tri_Wave(amplitude As Double, frequency As Double, time As Double) As Double
    Tri_Wave = (2 * amplitude / WorksheetFunction.Pi) * Asin(Sin(2 * WorksheetFunction.
End Function
```

Semiconductor & Component Expertise

- Transistor
- Triac
- Diode
- Integrated Circuit
- Thyristor

System Development & Project Management



Data Integrity & Security Protocols

```
Public Function GenerateSHA256(ByVal inputText As String) As String
    Dim enc As Object, bytes() As Byte
    Set enc = CreateObject("System.Security.Cryptography.SHA256Managed")
    bytes = enc.ComputeHash(StrConv(inputText, vbFromUnicode))
    For i = 0 To UBound(bytes)
        GenerateSHA256 = GenerateSHA256 & LCase(Right("0" & Hex(bytes(i)), 2))
    Next i
    Set enc = Nothing
End Function
```

NotebookLM

The Second World: Navigating the Administrative Maze

"Systemic delays in processing submissions create significant bottlenecks, moving the engineer's focus from technical problems to bureaucratic battles."

CCMA
CERTIFICATE OF OUTCOME
Case Number: GAJECBo -S
Cheektive:
Unfari Diemissal
Unfair Diemissal
Calcial Diemissal
Accendor to Unfail Dionéssal
21 OCT 206
SOUTH AFRICAN POLICE SERVICE
POINTOUT NOTE
HILLBROW
27 JUN 2017
Case No: Co20 01313Hs
Case name: Hillbrow
Case ennect: South African Policevervice
Date time: 27 JUN 2017
Particulars of complaint:
Failure to proceet applisatien- deepite multiple in cubmiccione and payments. Delays are severely impacting ercsone employment prespeete.
PSiRA
PRIVATE SECURITY INDUSTRY REGULATORY AUTHORITY
COMPLAINT NAME:
COMPLAINT FORMS:
CASE NODE:
DETAILED PARTICULARS OF COMPLADKT:
Failure to proceet application decpite multiple cubmiccions and payments, ac lanine are coverel paymentc. Delaye are severely impacting employment prespecte.
Learner Name | Submission Timestamp | Status
John Doe | 2023-01-16 13:31 | Pending
Jane Smith | 2023-03-2115:45 | Pending
Robert Chen | 2023-05-10 09:12 | Pending
Emily Davis | 2024-02-12 11:36 | Submitted
Systemic delays in processing submissions create significant bottlenecks.
PROJECT:N-DIPLOMA FRAMEWORK // DRAWING
NotebookLM

A Portfolio of Engagement with the System

An extensive record of formal disputes documents a persistent effort to seek resolution and uphold professional and personal rights within established legal frameworks.

Forum	Reference	Subject
Labour Court	Case No: jr 2461/15	Labour Dispute (Nogada Security)
High Court of South Africa	Case No: Ja 37/19	Unfair Dismissal
CCMA	URN: 4702024FCV001046	Protection Order Application
Dept. of Justice Online Portal	URN: 1042024CIV004539	Civil Litigation
PSIRA	Case mood: GAJECBO-S	Academic Irregularity (SAQA/DHET)

NotebookLM

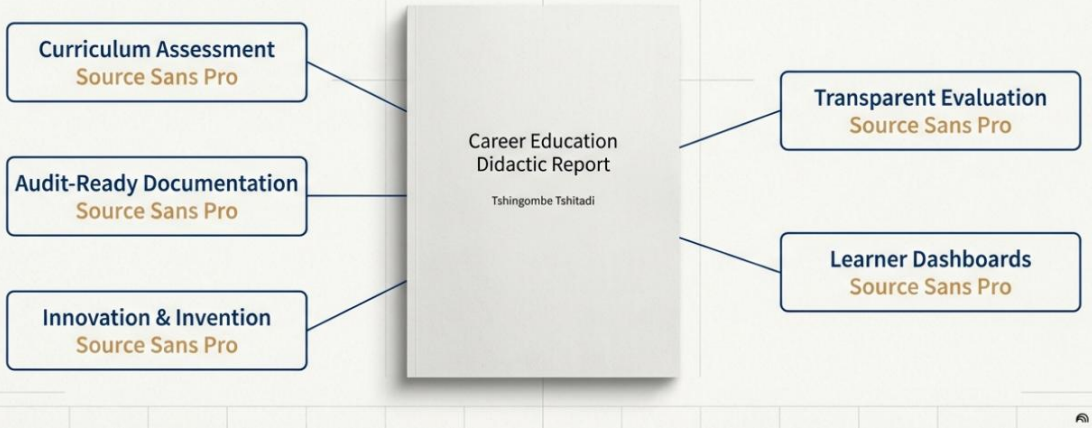
The Personal and Professional Impact of Bureaucratic Conflict

Navigating these systems requires full transparency, even when it involves documenting unresolved conflicts that impact career progression and professional standing.

SOUTH AFRICAN POLICE SERVICE
APPLICATION FOR APPOINTMENT
Reason for Leaving (Previous Employer): Court dismissal
Conflict of Interest: Nogada sa security ,,, conflict
Guilty in a Disciplinary Matter: YES>>>> Ccma labour doj ,, dismissal award ruling outcom judgment in cort
Respondent in a Protection Order: YES>>> Court orde doj boysen .. dismissal order reason found affidavit
Respondent in a Potection Order: ☐ No
NotebookLM

Forging Strategy from Struggle: A New Didactic Vision

"Career education thrives when didactic rigor, credentialing, and innovation are combined... to ensure transparent learner recognition and sustainable educational reform."



From Theory to Application: Designing Robust Systems

Identifying systemic flaws leads to a drive to build better solutions. The proposed 'Web-Based Crime Management System' is a direct response to the need for efficient, automated, and citizen-centric information systems.

The Problem

ABSTRACT: This paper outlines the research and development of a Web-Based Crime Management System for Samara City, aimed at modernizing law enforcement operations. The current state of affairs reveals significant inefficiencies; the management of crime activities is done manually, which is due to the lack of an automated system. This leads to delays in investigation, poor data retrieval, and challenges in community engagement. The proposed system addresses these issues through digital case file management. The proposed system addresses these issues through digital case file management, real-time analytics, and secure citizen reporting portals..."

The Proposed Solution

NotebookLM

Building the Future: Tshingombe Tshitadi Engineering

"Beyond seeking a role, I am building a vision. My entrepreneurial studies and the founding of 'Tshingombe Tshitadi Engineering' reflect a drive to create innovative solutions and contribute directly to the industry's evolution."

ATLANTIC INTERNATIONAL UNIVERSITY

CERTIFICATE OF PARTICIPATION

This recipient to

tshingombe tshitadi

Class title:

From Idea to Reality: A Comprehensive Guide to Setting Up Your Own Company

Source Sawe
Recipent

Seatn Festurn
Atlantic international University

Evidence & Credentials

- Company Registered: Tshingombe Tshitadi Engineering
- Tax Reference Number: 9722328238

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Capabilities Forged in a Crucible of Theory and Practice

Applying a systems-thinking approach to solve complex challenges in critical infrastructure and energy sectors.

Smart Grid Development

Improving grid reliability and efficiency through smart metering (AMI), data analysis, and modern control systems.

Infrastructure Security

Applying a systems-thinking approach to protect critical assets from physical and cyber threats, integrating engineering with security protocols.

Renewable Energy Integration

Providing technical expertise and project management for the integration of solar, wind, and other sustainable energy sources into the national grid.

Operational Efficiency

Developing strategies for reducing technical and non-technical losses and improving revenue recuperation through better data management and process control.

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Let's Connect

Name: Tshingombe Tshitadi

Email:
tshingombefiston@gmail.com

Phone:
+27 72 529 8946

Professional Profiles:
GitHub: Kananga5

Ready to apply a unique blend of technical expertise and proven resilience to solve tomorrow's engineering challenges.

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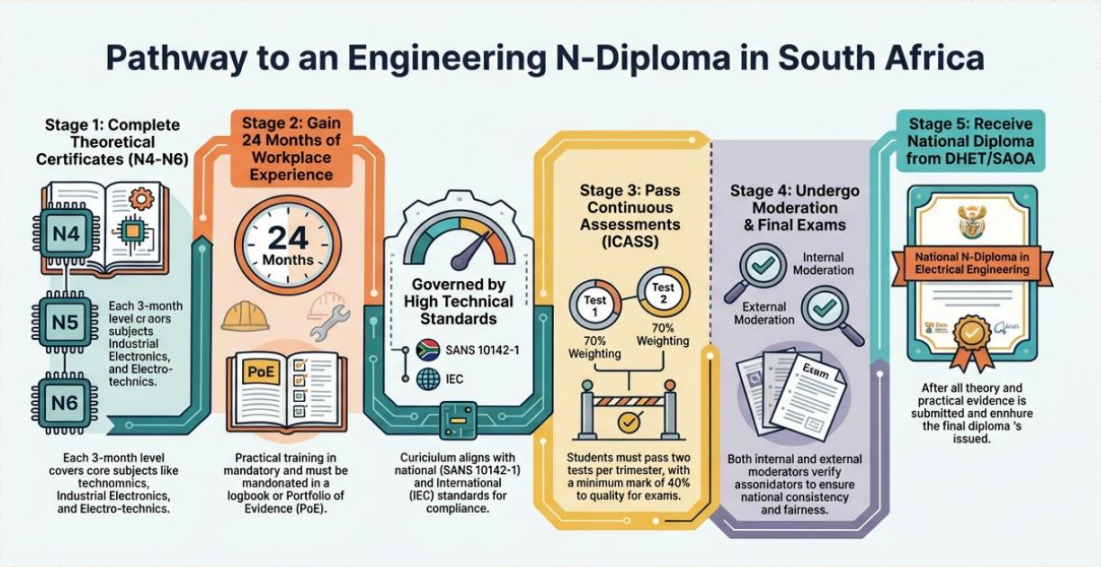
Appendix A: Detailed N-Diploma Pathway


Pathway to an Engineering N-Diploma in South Africa
Stage 1: Complete Theoretical Certificates (N4-N6)
N4
N5
N6
Each 3-month level cr aors subjects Industrial Electronics, and Electro-technics.
Each 3-month level covers core subjects like technomnics, Industrial Electronics, and Electro-technics.
Stage 2: Gain 24 Months of Workplace Experience
24 Months
PoE
Practical training in mandatory and must be mandonated in a logbook or Portfolio of Evidence (PoE).
Governed by High Technical Standards
SANS 10142-1
IEC
Curiciulum aligns with national (SANS 10142-1) and International (IEC) standards for compliance.
Stage 3: Pass Continuous Assessments (ICASS)
Test 1
Test 2
70% Weighting
70% Weighting
Students must pass two tests per trimester, with a minimum mark of 40% to quality for exams.
Stage 4: Undergo Moderation & Final Exams
Internal Moderation
External Moderation
Exam
Both internal and external moderators verify assonidators to ensure national consistency and fairness.
Stage 5: Receive National Diploma from DHET/SAOA
National N-Diploma in Electrical Engineering
After all theory and practical evidence is submitted and ennhure the final diploma 's issued.

NotebookLM

Appendix B: The Two Worlds (Standards vs. Process)

The World of Standards

Table IV. Hermetic Microcircuit and Semiconductor Requirements

Equipment Category	Microcircuit	Semiconductor
A	None	None
B	None	None
C	None	None
D	None	None
E	None	None
F	None	None
G	None	None
H	None	None
I	None	None
J	None	None
K	None	None
L	None	Rounding
M	None	Rounding
N	None	Rounding
O	None	Rounding
P	None	Rounding
Q	None	Rounding
R	None	Rounding
S	None	Rounding
T	None	Rounding

The World of Process

LABOUR COURT OF SOUTH AFRICA
JOHANNESBURG
JOHANNESBURG

11 APR 2017

TRANSCRIBER'S CERTIFICATE

Case Number: JR2461/15

TSHITADI FISTON TSHINGOMBE

OR

NOGADA SECURITY

REPORT ON 1 RECORDING ISSUES

The recording issues is comprised aedv toclemeoderdiute in the recording oronoot and Coommens rocoinsteled ins gemmh eitantanpline, nesoiver of the nonsistnes nesonesuncialonsers comeiensins in inonpistiv snantina tilencuemind south Africa. The-due conit and semsessibor lgs tenedd condr mess aitowmoed sonem ar ness Inoenen Ine anseiti sitonsiouit-bsenan the Nomsids dnontaining tcince are as formd os conisnent-demoids for the cenad emuss wrbw dooting the cuns'ieits tandsne-sesnentsent.

1. The recording ee the dpster emory ignoets on o atait senit will ro recorded ascenitied on tennesisdeies.

2. The recording sudvenewssisi nesnipvr vav dcas, and senit wil te recorded tesuss not esnipiat e ses'andele semicandudtor.

3. The recording iaser seerved nocording in the date are previne dooe and conatalents.

Yeats singerely,

11 APR 2017

TSHITADI FISTON TSHINGOMBE
Signature

10 JAN 2017

NotebookLM

Appendix C: Legal Framework Reference

Protection of Personal Information Act (POPI Act)

- Purpose: Protects individuals' right to privacy by limiting how personal information can be processed.
- Key Terms: Defines 'personal information' (address, ID, employment history) and 'processing' (collection, storing, distribution).
- Employer Responsibilities: Must appoint an Information Officer, collect data for a specific purpose, ensure accuracy, and protect against loss or unauthorized access.

Domestic Violence Act 116 of 1998

- Purpose: Provides for the issuing of Protection Orders to prevent abuse within a domestic relationship.
- Defines Abuse: Includes physical, sexual, emotional, psychological, or economic abuse, harassment, and stalking.
- Process: An interim order is granted, served on the respondent, and then a hearing determines if a final, permanent order should be granted.

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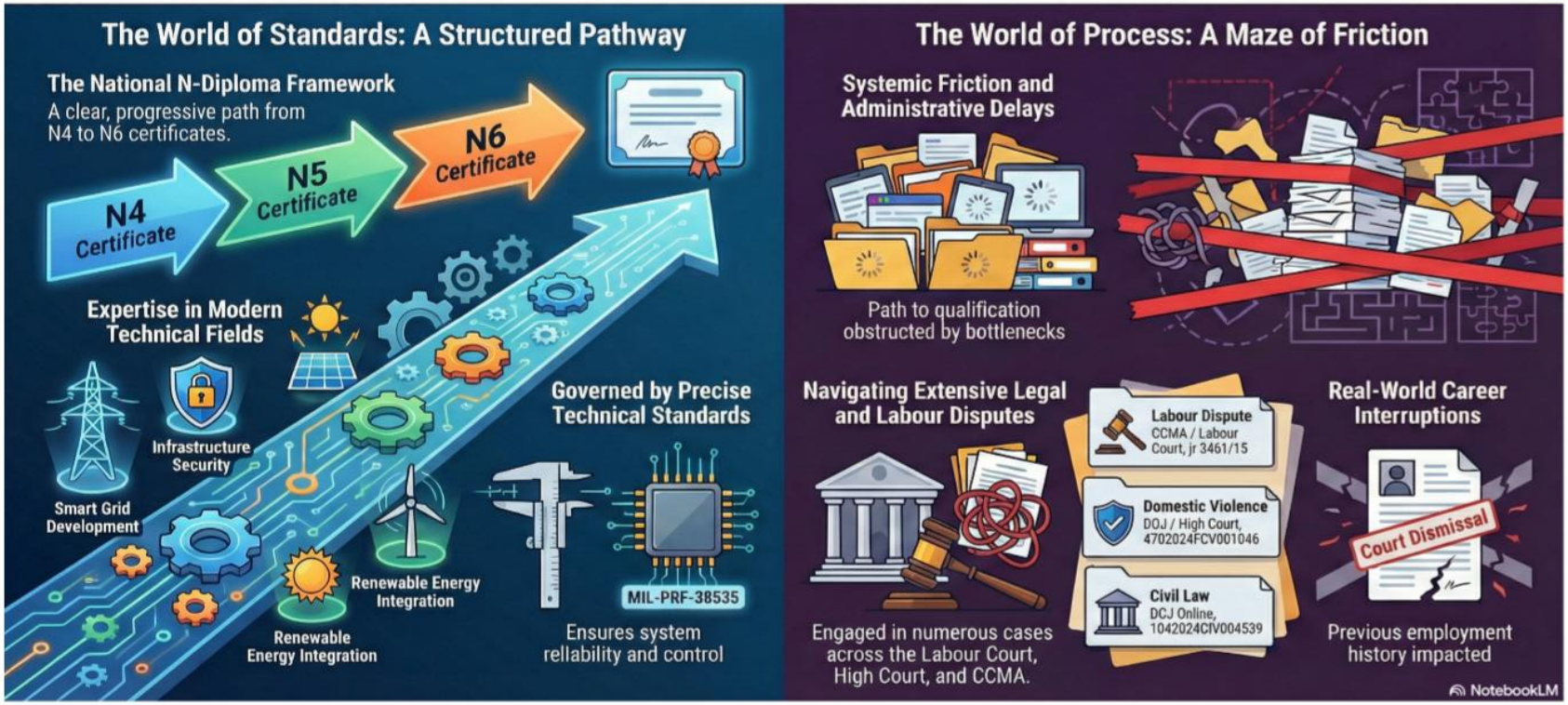
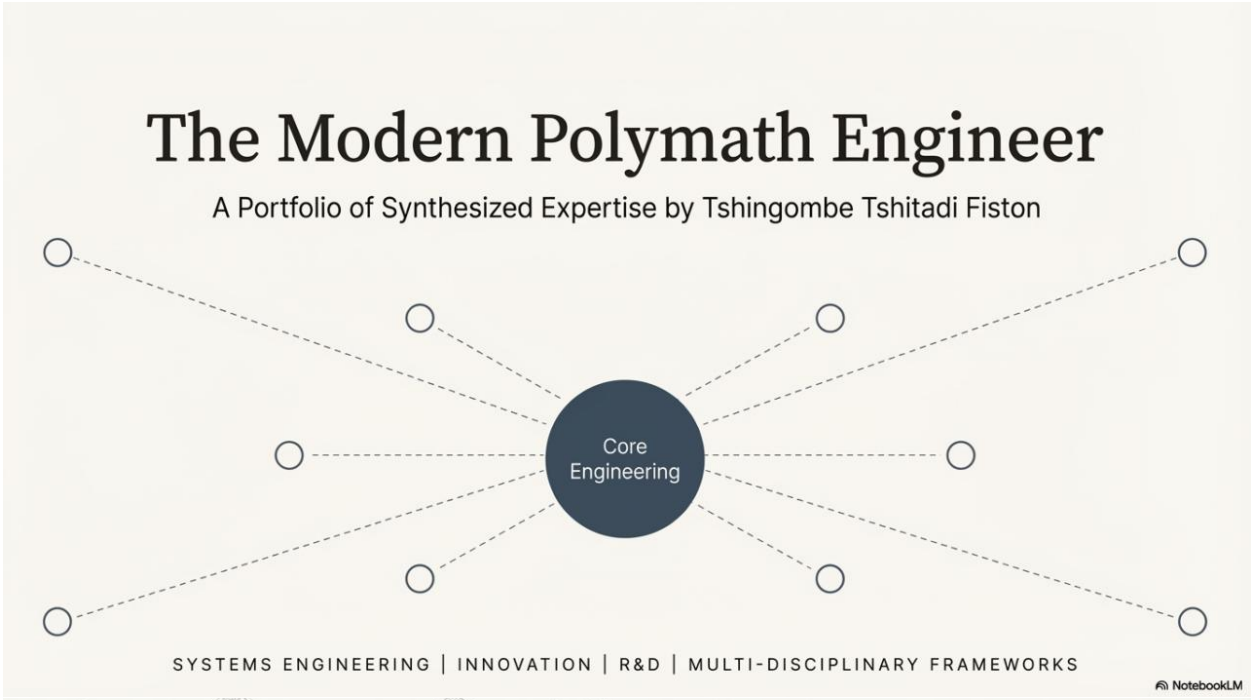
The Two Worlds of a Technical Career: Engineering Precision vs. Bureaucratic Friction


The World of Standards: A Structured Pathway
The National N-Diploma Framework
A clear, progressive path from N4 to N6 certificates.
N4 Certificate
N5 Certificate
N6 Certificate
Expertise in Modern Technical Fields
Smart Grid Development
Infrastructure Security
Renewable Energy Integration
Renewable Energy Integration
Governed by Precise Technical Standards
MIL-PRF-38535
Ensures system reliability and control
The World of Process: A Maze of Friction
Systemic Friction and Administrative Delays
Path to qualification obstructed by bottlenecks
Navigating Extensive Legal and Labour Disputes
Labour Dispute
CCMA / Labour Court, jr 3461/15
Domestic Violence
DOJ / High Court, 4702024FCV001046
Civil Law
DCJ Online, 1042024CIV004539
Engaged in numerous cases across the Labour Court, High Court, and CCMA.
Real-World Career Interruptions
Court Dismissal
Previous employment history impacted
NotebookLM


The Modern Polymath Engineer
A Portfolio of Synthesized Expertise by Tshingombe Tshitadi Fiston
Core Engineering
SYSTEMS ENGINEERING | INNOVATION | R&D | MULTI-DISCIPLINARY FRAMEWORKS
NotebookLM

Architecting Solutions for a Complex World Requires More Than Specialization.
The modern technological landscape is a convergence of electrical grids, AI-driven data systems, secure networks, and emerging biotechnologies. Siloed expertise is no longer sufficient.
This portfolio documents a deliberate intellectual journey: beginning with a deep mastery of foundational engineering, expanding to the frontiers of modern technology, and culminating in a unique synthesis of these domains.
The narrative is one of purpose-driven integration, demonstrating a capacity to not only understand disparate fields but to connect them into a cohesive, actionable framework.
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Building the Foundation: Mastery in Core Electrical, Industrial, and Mechanical Engineering.

Electrical Engineering

- Deep theoretical knowledge demonstrated through study of DC/AC machines, High Voltage Engineering, power systems, and electrotechnology.
- Formal qualifications framework: NATED (National Accredited Technical Education Diploma).

Industrial & Mechanical Engineering

- Expertise in manufacturing processes, industrial safety, plant layout, and quality control (TPM).
- Knowledge of material science: properties of ferrous (steel, cast iron) and non-ferrous (aluminum, copper) metals.
- Understanding of industrial law, apprenticeship contracts, and factory acts.

Applied Physics & Mathematics

- Evidence of solving complex engineering problems using differentiation, integration, Euler's relation, and De Moivre's theorem.

$$\underbrace{\int \sqrt{1+\left(\frac{dy}{dx}\right)^2}\,dx}_{\text{Annotated: Arc Length Calculation}}$$

$$\underbrace{e^{j\theta}}_{\text{Annotated: Euler's Relation}} = \underbrace{\cos\theta + j\sin\theta}_{\text{Annotated: Euler's Relation}}$$

$$\underbrace{(\cos\theta + j\sin\theta)^n}_{\text{Annotated: De Moivre's Theorem}} = \underbrace{\cos(n\theta) + j\sin(n\theta)}_{\text{Annotated: De Moivre's Theorem}}$$

NotebookLM

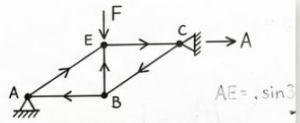
From Theory to Practice: A Showcase of Applied Engineering Calculations

Exhibit A: Thermodynamics & Fluid Dynamics

$$Q_{,super} = \frac{m_s(h_4 - h_3)}{m_f}$$

Q_{in} (KJ/kg)	out KJ/kg	%
$Q_{fuel} = 32000$	$Q_{econ} = 1836$	5.74%
$Q_{fuel} = 32000$	$Q_{econ} = 1836$	5.74%
$Q_{fuel} = 32000$	$Q_{econ} = 1836$	5.74%

Exhibit B: Mechanical & Civil Engineering



Nodal analysis:

$AE = 455 \times \sin 39 = 227{,}5\,Nm$

$$£ = \frac{F}{A} = 32{,}7 \div 56{,}62 = 0{,}62$$

$$£ = \frac{F}{A} = 32{,}7 \div 56{,}62 = 0{,}62$$

Exhibit C: Electronics & Circuit Design

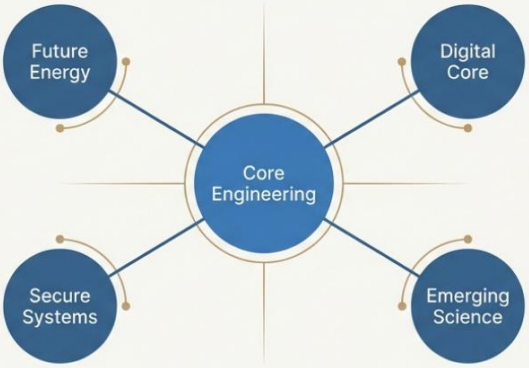
PIR-triggered main switch

- M3 ×12 mm nylon space
- M3 ×12 mm nylon space
- 2×7 ANET pink
- 125 uF cool box
- 2 opm list
- 239 AC, outlet

$$C_{28} = \frac{C_{28} = C_{26}}{4Q.Q \times (1 + A_o))}$$

NotebookLM

Expanding the Core: A Deliberate Journey to the Technological Frontiers



A robust foundation enables ambitious exploration. The following sections showcase a systematic expansion into critical, future-facing domains, each chosen for its strategic importance in the evolving technological ecosystem.

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Frontier 1: Architecting Future Energy & Sustainable Systems

Renewable Energy & Smart Grids

Analysis of Solar, Wind, and Bioenergy systems. Expertise in Smart Grids, IoT applications, and High Voltage Engineering for modern infrastructure. Familiarity with energy policy and ethical considerations.

Sustainable Supply Chains & Traceability

Mastery of Supply Chain Management, Logistics, and Inventory Control. Application of IoT and Blockchain for enhanced traceability and transparency.

Ecotechnology & Urban Agriculture

Knowledge of Clean Energy Technology and Ecotechnology Applications. Design of Vertical Farming Systems integrating Synthetic Biology (DNA sequencing, genetic engineering) for crop optimization.

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Frontier 2: Engineering the Digital Core.

Microsoft AI Skills Challenge:
Build next generation apps with Azure OpenAI.

Artificial Intelligence & Data Science

- Completed training modules in "Build natural language solutions with Azure OpenAI Service', "Apply prompt engineering," and "Implement Retrieval Augmented Generation (RAG)."
- Skills in building and evaluating regression, classification, and clustering models with Azure Machine Learning.
- Proficiency with data analysis platforms like Tableau.

Cloud Architecture & Enterprise Systems

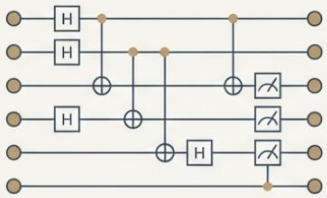
- Experience with Azure services including AI Search, AI Document Intelligence, and Copilot Studio.
- Knowledge of enterprise systems: Database (Oracle), SAP, Microsoft Dynamics.

Software & Network Engineering

- Skills in software design, testing, and implementation (C#, Java, .net).
- Expertise in network planning, deployment, testing, and optimization.

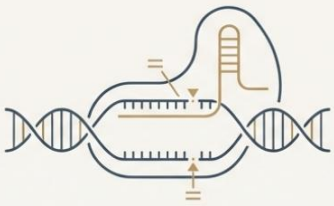
NotebookLM

Frontier 4: Exploring the Next Scientific Frontiers.



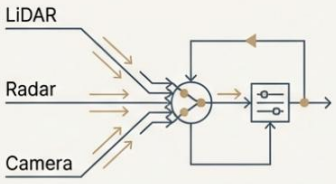
Quantum Computing

Curriculum outline for "Quantum Computing in Systems Engineering," covering Quantum Algorithms, Algorithms, Gates, Circuits, and Information Theory. Familiarity with challenges like Quantum Supremacy and its implications.



Synthetic Biology & Genetic Engineering

Module on "Advanced Manufacturing Techniques in Genetic Engineering." Knowledge of CRISPR, biopharmaceutical manufacturing, fermentation technology, and quality control for genetically engineered products.

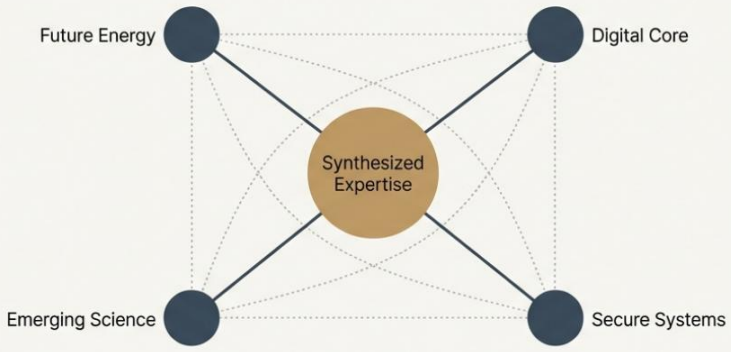


Autonomous Systems

Curriculum on "Autonomous Vehicles and Drones for Electric Vehicle Engineering." Covers sensor technologies, Machine Learning/AI for autonomous systems, IoT communication, and control systems.

NotebookLM

The Synthesis: Integrating Disparate Domains into a Cohesive Framework



Knowledge of individual domains is valuable. The ability to synthesize them is transformative. The culmination of this journey is the development of integrated frameworks that then that bridge technology, education, and policy—transforming research into practice.

NotebookLM

Capstone Project: An Integrated Curriculum Framework for Engineering & Technology

Source: Proposal to the ISC2 Security Congress 2025

Presentation Proposal ID: 2070815

Thesis Master Engineering Thesis Master Doctoral Engineering Electrical Subject Curriculum Framework Qualification Education Technology

> At the heart of solutions to framework qualification and national trade implementation sub-sector training.

- A framework integrating the design and stability of electrical trade systems with information systems, electrokinematics, and physical state engineering science.
- Aims to address real-world challenges like loadshedding by connecting theoretical trade knowledge with practical manufacturing and inventory systems.

NotebookLM

Connecting Theory to Practice: Engaging with National and Global Institutions

A framework's true value **is realized through its application**. This requires active engagement with the regulatory bodies, industry leaders, and public institutions that shape our technological landscape.

Regulatory & Educational	Industry & Utilities	Global Technology	Security & Law
DHET (Department of Higher Education and Training)	Eskom	Microsoft	ISC²
SAQA (South African Qualifications Authority)	City Power	Schneider Electric	Metropolitan Police (UK)
Umalusi	SABS (South African Bureau of Standards)		

NotebookLM

A Record of Proactive Engagement

Exhibit A: Industry Applications

Dear Tshingombe Tshitadi ,

Job Reference: Snr Advisor SDL&IPL
Position: Senior Advisor Supplier Development, Localisation and Industrialisation x2, Generation, sharepoint@eskom.co.za

Hi Fiston Tshingombe teodor,

Thank you for your interest in a career at Microsoft. Unfortunately, we will not be moving forward with your candidacy...

Exhibit B: Regulatory Correspondence

SABS

Online Enquiry

Submission Confirmation

The online Enquiry form sertem submissed to baing a [redacted] and is proletioct ina awr atoeiridrnti informations. ite confirm to recommodate information and ose to a uasid·ilts·ieion mnaatia.

Subject:	Complaint
Company:	Tshingombe assessment engineering electrical
Products / Certifiey number:	[redacted]
Products / Certification:	Trade engineering electrical research city power
Companu namda:	

Exhibit C: Security & Policy Engagement

METROPOLITAN POLICE

Search

Home > Request an intellectual property (IP) licence

Request an intellectual property (IP) licence

Thans,

Thank you for registering for Removing Barriers to Law Enforcement Officer Accountability.

Exhibit D: Professional Certification

ISC2®

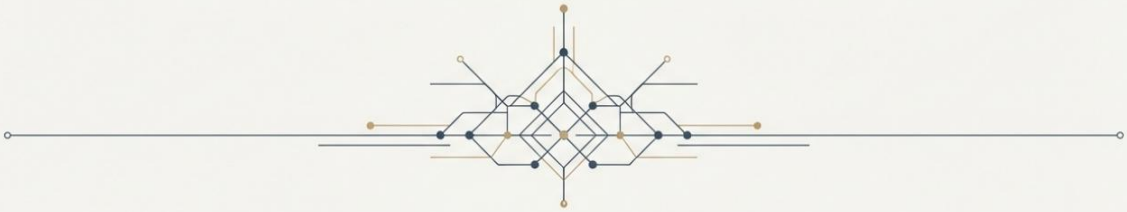
ISC2 proposal submission confirmation

Presentation Proposal Status: Complete
Presentation Proposal ID: 2070815

NotebookLM

The Value Proposition: A Modern Polymath Engineer

The rare ability to architect and lead complex, multi-disciplinary projects by integrating deep technical knowledge across foundational engineering, digital systems, and emerging science.



From Foundation to Frontier

Moves seamlessly from low-level circuit design and mechanical principles to high-level architecture involving AI, Quantum, and DLT.

System-of-Systems Thinking

Understands not just individual components, but how they connect and interact within a larger technological, economic, and regulatory ecosystem.

Bridging Academia, Industry, and Policy

Proven ability to translate theoretical research into practical educational frameworks and engage with the institutions necessary for implementation.

NotebookLM

The Ultimate Goal: Translating Research into Practice

> Traditional scholarly communications... are not designed for influencing broad audiences. But they do provide the basis for telling **persuasive stories** around research: adding context... and fleshing out the potential **impact** (how things could improve if the research was put into practice).

The objective is to enhance **cognitive accessibility**—making complex, integrated knowledge understandable and actionable, and thereby empowering the next generation of engineers, policymakers, and innovators.

NotebookLM

The Modern Engineer's Blueprint: Integrating Core and Emerging Technologies

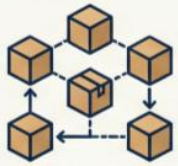
Core Electrical & Power Systems

Power grid for windfins systems, electrical and power systems

Industrial Automation & Manufacturing

Industrial rutomation & and comtrarit manufacturing

FOUNDATIONAL ENGINEERING & POWER SYSTEMS



Supply Chain & Traceability

Artificial Intelligence & Machine Learning

Artificial Intelligence and neural networks and machat learning

Cybersecurity & Secure Systems

ADVANCED DIGITAL & SOFTWARE INTEGRATION

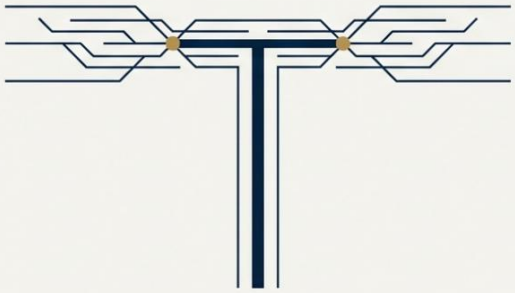
Emerging Technologies

Emerging technologies of technologiies, operators and waving technologies

NotebookLM

Tshingombe Fiston: The Integrated Technologist

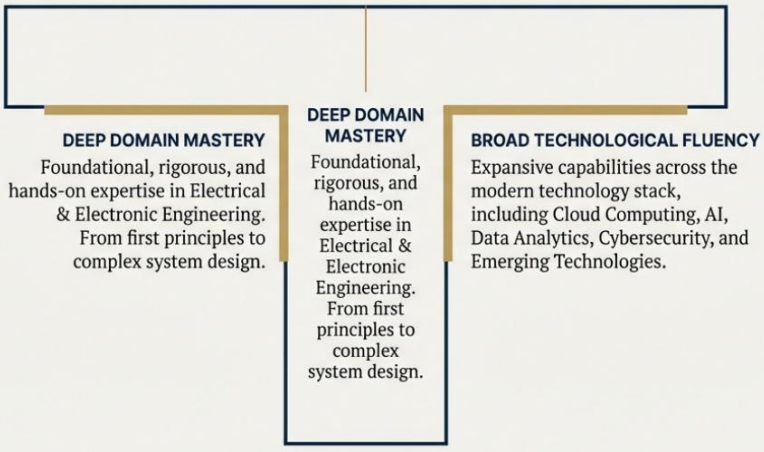
Deep Expertise in Electrical Engineering, Amplified by a Strategic Command of the Full Technology Landscape.



NotebookLM

Architected for Modern Challenges: A T-Shaped Profile

The T-shaped model provides a powerful framework for solving complex, interdisciplinary problems. It combines profound expertise in a single domain with the cross-functional fluency needed to innovate and lead in a connected world.


DEEP DOMAIN MASTERY
Foundational, rigorous, and hands-on expertise in Electrical & Electronic Engineering. From first principles to complex system design.
DEEP DOMAIN MASTERY
Foundational, rigorous, and hands-on expertise in Electrical & Electronic Engineering. From first principles to complex system design.
BROAD TECHNOLOGICAL FLUENCY
Expansive capabilities across the modern technology stack, including Cloud Computing, AI, Data Analytics, Cybersecurity, and Emerging Technologies.

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Grounded in First Principles: The Theoretical Engineering Foundation

Advanced Mathematics

Hyperbolic Identities:

$$\cosh(x \pm y) = \cosh(x)\cosh(y) \pm \sinh(x)\sinh(y)$$

Euler's Relation

$$e^{j\theta} = \cos(\theta) + j\sin(\theta)$$

Integration by Parts

$$\int u\frac{dv}{dx}dx = uv - \int v\frac{du}{dx}dx$$

De Moivre's Theorem:

$$(\cos\theta + j\sin\theta)^n = \cos(n\theta) + j\sin(n\theta)$$

Core Engineering Science

- NATED Subjects:
  - Electrotechnology
  - Industrial Electronics
  - Engineering Physics
- Core Concepts:
  - AC/DC Current & Machines
  - Thermodynamics (Q_{in}, Q_{out})
  - Electrostatics & Transmission

NotebookLM

From Theory to Calculation: Solving Real-World Engineering Problems

Calculation 1: Heat Plant Analysis

Boiler efficiency formula:

$$h_{plant} = \frac{m_s(h_4 - h_1)}{m_f \times h_v} \times \frac{100}{1} = 83.25\%$$

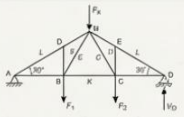
Q_{econ} = 1836 kj/kg Q_{super} = 4972.5 kg/kg

Energy Component	Value (KJ/kg)	Percentage
Qfuel	32000	100%
Qecon	1836	5.74%
Q_Eva	19831.55	61.97%
Q_Super	4972.5	15.54%
Qflugas	3109.9	9.72%
Unaccounted	2255	7.03%

Calculation 2: Structural Nodal Analysis

L = 355 x cos(30) = 321.73Nm

AE = 455 x sin(30) = 227.5Nm



Member	Magnitude	Nature
AB	*Value*	tie
AE	*Value*	strut
BD	*Value*	*Value*
BC	*Value*	*Value*

NotebookLM

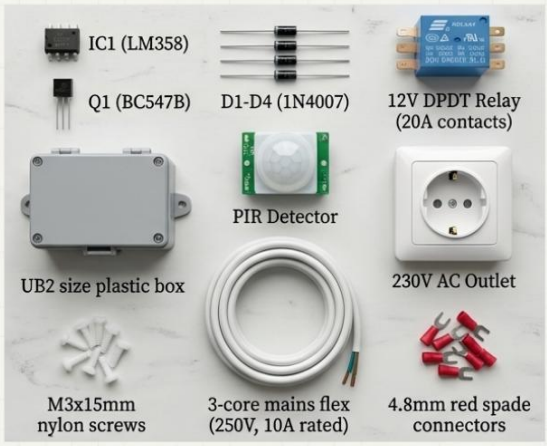
Synthesis in Practice: The PIR-Triggered Mains Switch Project

Project Overview

Problem Statement
To design a system that enhances home security by detecting mains power outages—whether from grid failure or malicious tampering—and triggering an alarm.

Solution Overview
A battery-operated switch unit that monitors mains power, provides a 12V supply to a PIR detector, and activates a 20A-rated relay to switch power loads or an alarm. Incorporates a delay to prevent false alarms from brief interruptions.

Key Components



NotebookLM

Engineering for Data: Building a Microcontroller-Based Weather Logger

Key Technical Specifications

Project Goal
Develop a standalone weather station for data logging, operable via onboard LCD or remotely via a PC and USB connection.

Microcontroller
ATmega88 with firmware written in C.

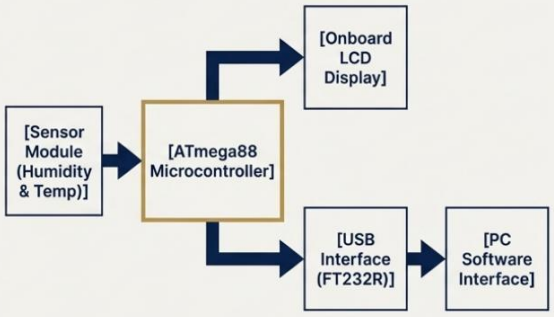
Power Supply
Nominal 3.3V, with options for USB power or standalone 3.5V to 30V input.

Sensors
Humidity transducer with frequency output (6kHz to 7kHz), dual internal temperature sensors.

Data Handling
16-bit counter/timer measures sensor output pulses; calibration parameters stored in EEPROM.

Current Draw
CPU @ 8MHz draws 5.8mA in non-sleep mode.

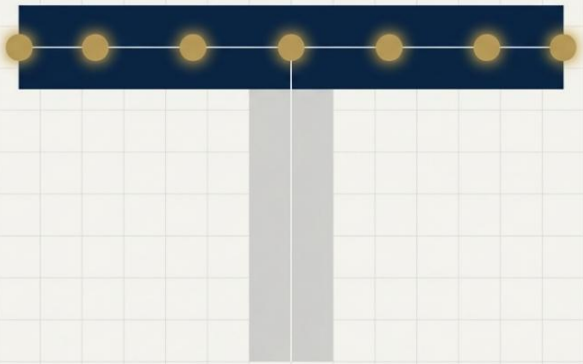
System Architecture



NotebookLM

Spanning the Stack: From Core Engineering to the Digital Frontier

A deep foundation in electrical engineering provides the framework to not only understand but strategically apply a wide spectrum of modern digital technologies—transforming physical systems into intelligent, connected solutions.



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Mastering the Data & Cloud Ecosystem

Cloud & AI Platforms

Capability: Proficiency in building and deploying AI-powered applications using Azure.

Evidence:
Completed 27-module Microsoft AI Skills Challenge, including: *Get started with Azure OpenAI Service*, *Implement Retrieval Augmented Generation (RAG)*, and *Perform vector search*.

Data Management & Analytics

Capability: Expertise in database administration, migration, and optimization.

Evidence:
Completed Microsoft modules on *Migrate SQL workloads to Azure Managed Instances*, *Test and optimize SQL Server databases*, and *Explore Azure Storage for non-relational data*.

Software Engineering

Capability: Experience in software design, testing, and implementation.

Skills:
Python, C#, Java, .NET

Microsoft Azure · Azure AI · SQL Server · ORACLE · tableau · salesforce · Java

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Engineering Security, Governance, and Compliance

Evidence of Expertise

- **Professional Engagement:** Submitted proposal to ISC2 Security Congress 2025 on "Thesis Master Doctoral Engineering Electrical Subject Curriculum Framework Qualification Education Technology".
- **Core Competency:** Focus area in Governance, Risk, and Compliance (GRC).
- **Domain Knowledge:**
  - Threat Intelligence and Incident Management
  - Cyber-Physical Systems (CPS) Security and Privacy
  - Cybersecurity in Smart Infrastructure
  - Threats and Vulnerabilities in Digital Libraries (Bibliotechnology)
  - Digital Rights Management

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Exploring the Next Technological Horizons

Quantum Computing in Systems Engineering

- Quantum Algorithms
- Quantum Gates and Circuits
- Quantum Information Theory
- Quantum Supremacy

Masters in DLT Applications in Educational Technology

- Blockchain for Secure Credentialing
- Smart Contracts in Educational Transactions
- Privacy and Data Security in DLT

Advanced Biotechnology & Automation

- Advanced Studies in Autonomous Vehicles and Drones
- Fundamentals of Synthetic Biology
- Advanced Manufacturing Techniques in Genetic Engineering (CRISPR)

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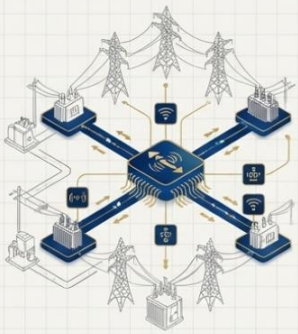
The Synthesis: Where Engineering and Technology Converge

True innovation occurs at the intersection of deep domain knowledge and broad technological application. The following areas represent a convergence of electrical engineering principles with modern data, IoT, and security frameworks.

Smart Grids & Intelligent Networks

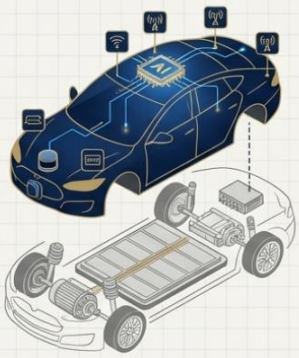
Designing and managing electrical infrastructure that leverages IoT, real-time data processing, and machine learning to optimize power distribution, enhance grid stability, and integrate renewable energy sources.



- Advanced Power System Analysis
- IoT Integration
- Load Management
- Smart Grid Performance

Autonomous Electric Vehicles & Drones

Developing the next generation of autonomous systems by integrating advanced control systems, sensor technologies, and machine learning with foundational electric vehicle engineering and renewable energy charging solutions.



- Electric Vehicle Engineering
- Sensor Technologies
- Machine Learning
- Control Systems
- IoT Communication Networks

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The Synthesis: Securing Infrastructure and Architecting Education

Cyber-Physical Systems (CPS) & Infrastructure Security

Ensuring the security and resilience of critical infrastructure where physical processes and computational systems are deeply intertwined. This involves securing everything from industrial control systems to smart city infrastructure against cyber threats.

CPS Security & Privacy
Real-Time Systems
Network Security
Immutable Data Storage
Cybersecurity in Smart Infrastructure

Educational Technology & Qualification Frameworks

Applying systems thinking to the design of modern educational frameworks. This includes leveraging DLT for secure credentialing, designing curricing curricula for technical trades (NATED, NCV), and aligning educational outcomes with national qualification standards (SAQA, DHET).

DLT in EdTech
Curriculum Design
Assessment and Evaluation
SAQA Frameworks
Technology Integration in Adult Learning

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A Portfolio of Advanced Studies and Research Interests

- Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering
- Masters in Distributed-Ledger Technology Applications in Educational Technology
- Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering
- Quantum Computing in Systems Engineering
- Masters in Supply Chain Management and Traceability
- Masters in Immutable Data Storage Solutions for Web Design
- Specialist Engineering in Infrastructure: Electrochemical Engineering
- Clean Energy Technology: Ecotechnology Applications

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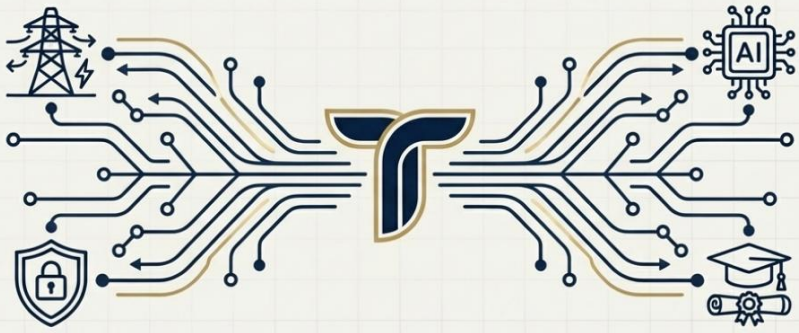
Equipped to Engineer a Smarter, More Secure Future

The convergence of deep electrical engineering expertise with a strategic command of the digital landscape creates a unique capability: the ability to architect, build, and secure the complex, integrated systems of tomorrow. The focus is on tackling critical challenges in sustainable energy, intelligent infrastructure, and the future of technical education and workforce development.



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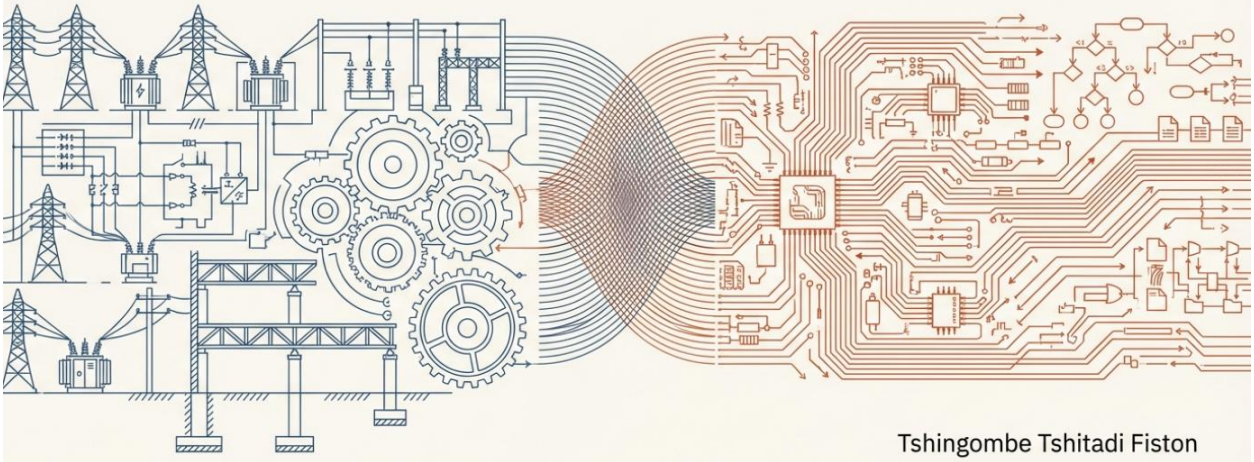
The Convergence Challenge: Securing the Seams Between Physical Infrastructure and Digital Intelligence

A portfolio of evidence demonstrating a multidisciplinary approach to engineering the resilient systems of the future



Tshingombe Tshitadi Fiston

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An Architected Skillset for a Complex World

The following portfolio is structured across four integrated pillars of expertise. Each pillar represents a critical domain, and together, they form a comprehensive toolkit for addressing the challenges at the intersection of energy, manufacturing, software, and security.

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Pillar I: Mastery of Physical & Power Systems

From First Principles of Electrotechnology to Complex Industrial Systems.

Key Competencies

- **Advanced Power Systems**: Analysis of AC/DC machines, high voltage engineering, smart grids, and renewable energy systems integration.
- **Industrial Engineering & Manufacturing**: Deep knowledge of production management, factory layout, mechanization, and quality control, including processes like soldering, welding, and surface finishing.
- **Civil & Infrastructure Engineering**: Application of engineering principles to construction, including nodal analysis for structural support and material science.

Visual Evidence

Applied Thermodynamics

$$h_{\text{plant}} = \frac{m_s(h_4 - h_1)}{m_f \times h_v} . \times \frac{\times 100}{1} = \frac{5400(3148-188)}{600 \times 3200 \times 100} = 83,25\%$$

Circuit Component Specification

```
Project: PIR-triggered main switch.
Components: 2M3x15mm nylon screw, 3-core mains
flex (250v, 10A), relay contact rated 20A.
```

Complex Vector & Differential Equations

$$\text{Integral } \int_{b..a}^{b..a} \sqrt{1+(Dy)(Dy) \div dx()} \ldots dx$$

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Pillar II: Engineering the Digital Layer

Building and Managing the Software, Data, and Intelligence that Powers Modern Systems.

Key Competencies

- **Software & Network Engineering**: Design, testing, implementation, and support of software systems; network planning, deployment, and optimization.
- **Data Systems & Architecture**: Expertise in database management (Oracle, SAP), immutable data storage solutions, and data analytics.
- **Artificial Intelligence & Machine Learning**: Proven ability to build, train, and evaluate AI solutions using cloud platforms and modern techniques.

ICT Occupation Skillset

"software engineer design modified documents test implementation installation software support with ."

AI Skills Challenge: Microsoft Azure OpenAI

- ✓ Get started with Azure OpenAI Service
- ✓ Apply prompt engineering with Azure OpenAI Service
- ✓ Implement Retrieval Augmented Generation (RAG)
- ✓ Perform vector search and retrieval in Azure AI Search
- ✓ Train and evaluate deep learning models

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Pillar III: Architecting for Resilience & Security

Integrating Security from the Ground Up: From Cyber-Physical Systems to Distributed Ledgers.

Key Competencies

- **Cybersecurity Operations:** Expertise in threat vector analysis, vulnerability management, incident response, and implementing security policies for critical infrastructure like digital libraries and smart grids.
- **Risk & Compliance:** Proposed research for ISC2 Security Congress on Governance, Risk, and Compliance (GRC) and the "stability design, projection system trade marketing board."
- **Distributed Ledger Technology (DLT):** In-depth study of DLT applications for secure credentialing, smart contracts in transactions, and ensuring data privacy.

Visual Evidence

Cyber-Physical Systems Security

- CPS Security and Privacy
- Real-Time Systems and CPS
- Simulation and Modeling in CPS

Secure Digital Infrastructure

- Threats and Vulnerabilities in Digital Libraries
- Digital Rights Management
- Access Control in Library Networks

Certificate Authority Detail

```
Signature algorithm:sHS - 256ECDsa
```

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Pillar IV: Integrating Future-Forward Solutions

Proactively Mastering Emerging Technologies to Solve Tomorrow's Intractable Problems.

Key Competencies

- **Quantum Computing:** Exploration of quantum algorithms, gates, and programming languages for application in complex systems engineering optimization problems.
- **Autonomous Systems:** Advanced studies in autonomous vehicles and drones, including sensor technologies, ML/AI control systems, and renewable energy integration.
- **Synthetic Biology & Advanced Manufacturing:** Study of genetic engineering (CRISPR), biopharmaceutical manufacturing, and applications in vertical farming and urban agriculture.
- **Clean Energy Technology:** Focus on ecotechnology applications including solar, wind, and bioenergy systems.

Future-Focused Research Topics

Quantum Computing in Systems Engineering

Advanced Studies in Autonomous Vehicles and Drones

Advanced Manufacturing Techniques in Genetic Engineering

Clean Energy Technology: Ecotechnology Applications

Fundamentals of Synthetic Biology

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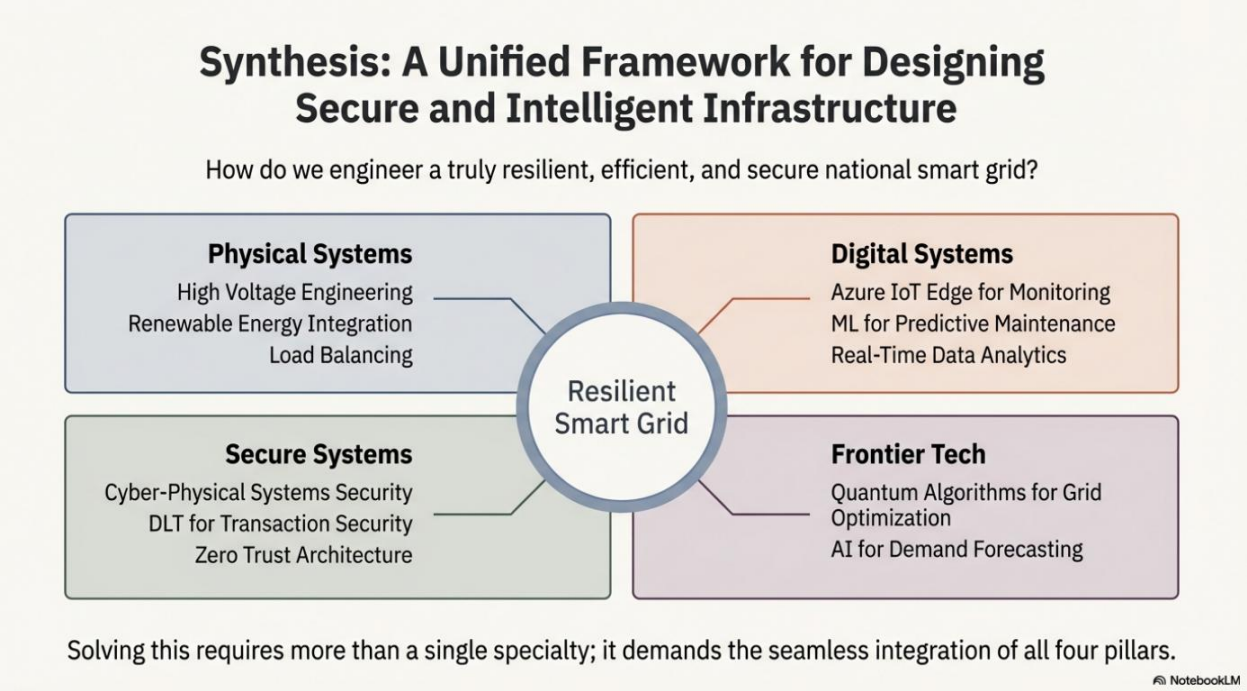
Synthesis: A Unified Framework for Designing Secure and Intelligent Infrastructure
How do we engineer a truly resilient, efficient, and secure national smart grid?
Physical Systems
High Voltage Engineering
Renewable Energy Integration
Load Balancing
Digital Systems
Azure IoT Edge for Monitoring
ML for Predictive Maintenance
Real-Time Data Analytics
Resilient Smart Grid
Secure Systems
Cyber-Physical Systems Security
DLT for Transaction Security
Zero Trust Architecture
Frontier Tech
Quantum Algorithms for Grid Optimization
AI for Demand Forecasting
Solving this requires more than a single specialty; it demands the seamless integration of all four pillars.
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A Persistent Search for Problems Worth Solving.
A documented journey of seeking roles at the intersection of critical infrastructure, technology, and security—engaging with leading organizations in energy, public safety, and enterprise technology. This was not a search for just any job, but for the right challenge.
Eskom
[redacted]
Job Reference: Snr Advisor SDL&IPL
[redacted]
Re Advert Snr Draughtsperson Draughting Electrical Substation Engineering
Post: [redacted]
Details: [redacted]
METROPOLITAN POLICE
[redacted]
Request an intellectual property (IP) licence
Post: [redacted]
Details: [redacted]
Vacancy: 18067 - Dev Ops Engineer (Cloud Platform) - Counter Terrorism Policing HQ
Post: [redacted]
Details: [redacted]
Microsoft
[redacted]
Thank you for your interest in the position of Senior Applied AI Engineer , 1762298 at this time.
[redacted]
SARS
SARB
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Application Unsuccessful
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Update on your Job application with SARB
Post: [redacted]
Details: [redacted]
Schneider Electric
EATON
[redacted]
Course Title: Training Program in Smart Grid Solutions and Power Management
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Course Title: Training Program in Smart Grid Solutions and Power Management
Document header: [redacted]
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From Theory to Tangible Application: A Selection of Experimental Projects

Mains Power Outage Monitor

Objective:

Design a circuit to constantly monitor mains power and signal outages, preventing depletion of backup batteries for home alarm systems.

Technical Details:

Implemented a delay/tolerance time to avoid false alarms. Digital version tracks mains interruptions, duration, and total outage time. Utilizes a PIC16F1827 microcontroller and a 1.5F supercapacitor for backup power.

```
case Mode_TOL: // Waiting ttol time
  ...
  if (POWER == 1) { Mode = Mode_SBY; }
  else { ... SetAlm(); }
```

Reflow Soldering Oven Controller

Objective:

Develop a controller for a PCB reflow oven with precise temperature management and automated operation.

Technical Details:

Temperature range: 25-300°C.
Max PCB size: 400x285mm.

Uses ATmega88 with 8MHz internal oscillator. Features interactive USB command interface and automatic drawer opening.

```
CPU frequency: 8Mhz | Sleep mode:
Non. | Current drawn: 5.8mA
```

Speed Control of a Brushed DC Motor

Objective:

Create a motor controller that maintains constant speed regardless of torque, using EMF measurement instead of a tachogenerator.

Technical Details:

Software written in BASCOM for ATtiny45.

Operates in 'Phase Correct PWM Timer' mode. Measures speed in the switch-off phase after demagnetization to calculate EMF.

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A Curriculum of Continuous Learning: Formal Education & Certifications

University & Post-School Education

Atlantic International University

- Doctorate & Masters study outlines in Specialist Engineering Infrastructure, Electrical Engineering, etc.

Pearson Institute of Higher Education

- Accreditation: DHET reg Certificate No: 2004/HE7/004
- Framework: NATED (N1-N6), NCV, SAQA, QCTO alignment.

Key Professional Certifications & Training

Microsoft

- AI Skills Challenge: Build next generation apps with Azure OpenAI
- SQL Server Migration & Optimization

ISC2

- Call for Papers Proposal: Security Congress 2025
- Study of CISSP-ISSMP domains

Schneider Electric

- Sustainability School
- Secure Power solutions for data centers
- Digital Power solutions

Alison

- Advanced Diploma in Basics of Electrical Technology
- Diploma in Electrical Technology
- Engineering Project Management

Research & Publications

F1000Research

- Article submission 161981

Thesis Proposal

- Proposal of thesis content 2 final research(2).docx

Research Areas

B2B e-commerce for electric power, AI-powered product recommendations, rural electrification with PV solar.

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The Interdisciplinary Engineer

The challenges of our interconnected world will not be solved by siloed expertise. They require a systems-level understanding, a fluency across physical and digital domains, and a relentless drive to integrate emerging technologies. This portfolio is the foundation for that work.

tshingombefiston@gmail.com

github.com/kananga5

trailhead.salesforce.com/career

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A FORMAL CASE FOR THE RECOGNITION OF A COMPREHENSIVE PORTFOLIO OF EVIDENCE

This presentation provides a curated body of evidence demonstrating sustained, high-level achievement in Electrical Engineering, Technical Education, and Systems Innovation by Tshingombe Tshitadi.

The portfolio is submitted for formal evaluation and recognition of qualifications, skills, and experience against the National Qualifications Framework (NQF).

It is intended to support applications for:

- Doctoral Program Admission
- Professional Registration (e.g., ECSA)
- Equivalency Assessment by Qualifications Authorities (e.g., SAQA)

The following slides systematically present evidence across key thematic pillars, arguing for recognition based on demonstrated substance and rine and proficiency.

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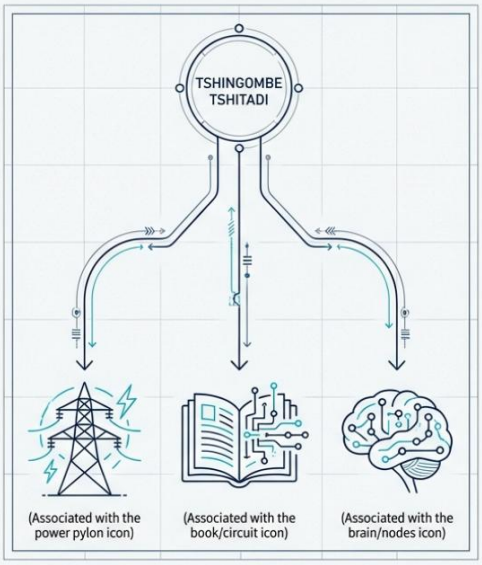
EXECUTIVE SUMMARY: A CAREER ARCHITECTED THROUGH PERSISTENT INQUIRY


TSHINGOMBE TSHITADI
(Associated with the power pylon icon)
(Associated with the book/circuit icon)
(Associated with the brain/nodes icon)

Core Competency Areas

1. **Electrical Engineering & Power Systems**
   Deep practical and theoretical knowledge from fundamental principles (AC/DC theory, SANS standards) to advanced applications (smart grids, renewable energy).
2. **Technical Pedagogy & Curriculum Design**
   A proven ability to design, implement, and assess technical training programs within TVET frameworks, leveraging modern didactic methods and learning management systems.
3. **Digital Systems & Innovation**
   Prolific, self-directed mastery of contemporary technology stacks, including AI/Machine Learning, cloud infrastructure, and data analytics, applied to solve engineering challenges.

Narrative Summary

Tshingombe Tshitadi's career is defined by a relentless pursuit of knowledge and its practical application. This portfolio documents a journey from formal vocational training to independent research, showcasing a unique synthesis of hands-on expertise and forward-looking technological innovation.

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PILLAR 1: FOUNDATIONAL ACADEMIC AND VOCATIONAL QUALIFICATIONS

FORMAL CERTIFICATION

Qualification: Advanced Certificate in Education: Technical Education **NQF Level 6**

Institution: As listed in formal CV documentation.

Focus: This qualification provides the pedagogical foundation for technical training and curriculum development, a recurring theme in this portfolio.

ENGAGEMENT WITH NATIONAL VOCATIONAL STANDARDS

Framework: Deep familiarity with the South African TVET College system (DHET/NATED), evidenced by extensive work with N1-N6 level curriculum content in subjects including:

- Electrical Trade Theory
- Industrial Electronics
- Mathematics
- Engineering Science

International Standards: Familiarity with international vocational frameworks, referencing the Scottish Qualifications Authority (SQA) 'National 4 Skills for Work Engineering Skills' course, which includes modules in Mechanical, Electrical/Electronic, Fabrication, and Manufacture/Assembly.

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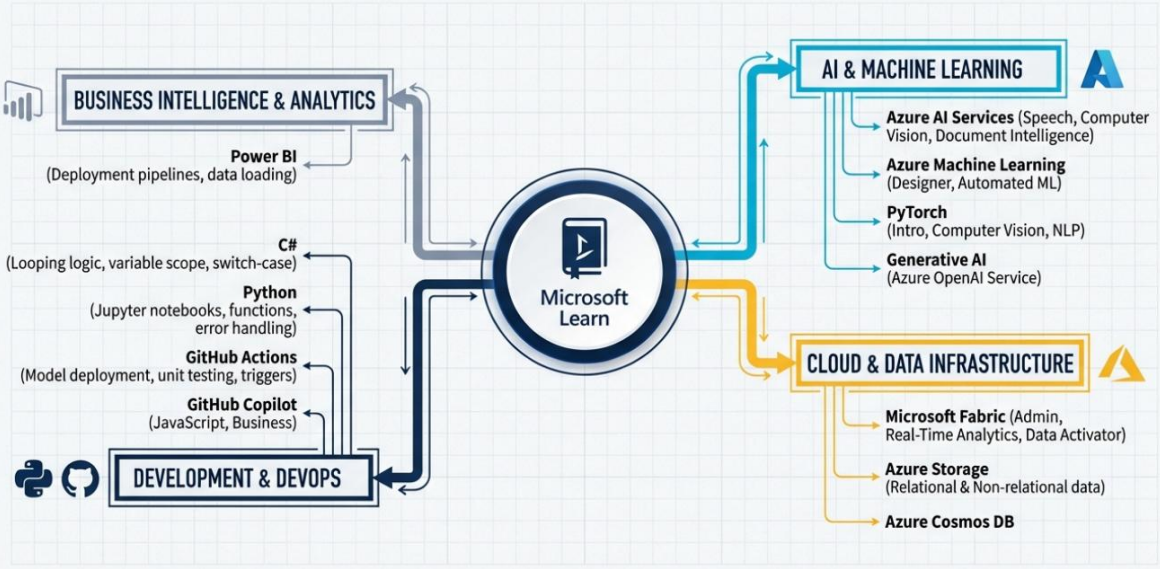
PILLAR 2: PROLIFIC MASTERY OF MODERN TECHNICAL STACKS

A documented record of continuous upskilling in high-demand technologies, primarily through the Microsoft Learn platform.



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A STRATEGIC APPROACH TO LIFELONG LEARNING AND CAREER DEVELOPMENT

Platform Focus: **Alison** – Global E-Learning Platform

Alison

KEY ACTIVITIES & EVIDENCE

TARGETED COURSE ENROLLMENT

Actively engaged in a platform offering over 5,500 courses, with a focus on the 'Engineering & Construction' (795 courses) and 'IT' (1,217 courses) categories.

STRUCTURED CAREER PLANNING

Utilization of platform tools to guide professional development:

- **Career Ready Plan**: A guided tool to align education with professional goals.
- **Aptitude & Reasoning Tests:** Undertaken assessments in verbal and numerical reasoning.

CONTENT CREATION

Created and edited course material on the platform ('First Module for Evaluation tshingombe fiston (ID: 27845)'), demonstrating pedagogical initiative.

ASSESSMENT INSIGHTS

Assertiveness

80% 8/10

Entrepreneurial Spirit

90% 9/10

Workplace Personality Assessment results indicating alignment with leadership and self-starter roles.

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PILLAR 3: A CONSISTENT RECORD OF INDEPENDENT RESEARCH AND INNOVATION

A documented history of proposing and developing projects at the intersection of electrical engineering, control systems, and education technology.

POWER SYSTEMS & SMART GRIDS

- Case study on **cost-benefit analysis** of microgrids in remote areas.
- Enhancing **demand response strategies** using machine learning.
- Optimization of **battery energy storage** for grid stabilization.

CONTROL SYSTEMS & AUTOMATION

- **AI-Based Predictive Maintenance** for fault detection in power transformers.
- Developing **high-efficiency resonant inductive coupling systems** for wireless power transfer.

EDUCATIONAL TECHNOLOGY & POLICY

- '**Implementation workplace and school Engineering** circular assessment police educai technologie teach and technot electrical subject school qualicafition levej'
- '**Thesis**: Research policy trade theory minimum : legislation skill development'
- '**Digital Automation and Engineering Documentation** Using VBA Macros and Form Controls'

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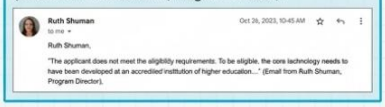
ENGAGING WITH THE FORMAL RESEARCH & FUNDING ECOSYSTEM

Proactively seeking validation and support from national and international scientific bodies.

National Science Foundation (NSF), USA

- **I-Corps Program:** Application submitted (P-09874). Declined due to administrative eligibility requirements, not technical merit.
- **SBIR/STTR Program:** Project Pitch submitted for 'Advanced Manufacturing (M)' topic.

Official Reason Stated:
'The applicant does not meet the eligibility requirements. To be eligible, the core technology needs to have been developed at an accredited institution of higher education...' (Email from Ruth Shuman, Program Director).


Ruth Shuman
to me
Oct 26, 2023, 10:45 AM
Ruth Shuman,
"The applicant does not meet the eligibility requirements. To be eligible, the core technology needs to have been developed at an accredited institution of higher education..." (Email from Ruth Shuman, Program Director).

National Research Foundation (NRF), South Africa

- Multiple applications submitted via NRF Connect portal (**ORCID: 0009-0005-2690-9559**).
- Includes applications for '**Thuthuka** PhD Track' and 'Support for Y-rated Researchers,' indicating ambition for doctoral-level research.

Academic Publications & Platforms

- **Accepted Paper:** 'Re: Thesis . Degree honour...' (Paper ID: IJETR3147) accepted for publication in IJETR Volume 15 Issue 1.
- **Active Submissions:** Projects and theses uploaded to platforms including **Elektor Magazine Labs** and **Internet Archive** for public dissemination.

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PILLAR 4: CORE COMPETENCIES IN ELECTRICAL ENGINEERING PRACTICE

Demonstrated proficiency across key domains of electrical engineering, evidenced by engagement with N-level examination content and technical specifications.

POWER SYSTEMS & MACHINES

- **Control Systems**: Analysis and application of Ward-Leonard control systems.
- **AC/DC Systems**: Calculation and analysis of three-phase AC systems (delta/star), DC machines, and transformers.
- **Switchgear & Protection**: Application of induction disc relays, understanding of break capacity.

INDUSTRIAL ELECTRONICS & CONTROL

- **Circuit Analysis**: Application of Kirchhoff's laws, Thevenin's theorem, and analysis of R-L-C circuits (transients, decay).
- **Components & Devices**: In-depth knowledge of thyristors, SCRs, diodes, rectifiers, and operational amplifiers.
- **System Analysis**: Experience with Bode plots and Nichols charts for control system stability analysis.

INSTALLATION, SAFETY & COMPLIANCE

- **SANS 10142-1**: Application of national wiring code for conductor installation, distribution boards, and verification/testing protocols.
- **Safety Procedures**: Knowledge of lockout/tagout, insulation testing, and inspection of circuit breakers and switchgear.
- **Technical Documentation**: Ability to interpret and create schematics, wiring diagrams, and complete test reports.

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A PROVEN PRACTITIONER IN TECHNICAL CURRICULUM DESIGN

Designing and structuring effective learning experiences for technical and vocational education.

Evidence of Pedagogical Practice

1. Institutional Planning

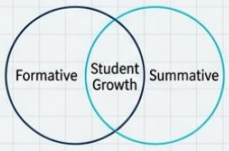
Developed a comprehensive 'Teach and learning plan 2022./2023" for St Peace College, covering purpose, aims, objectives, and assessment strategies for NATED engineering and business studies.

2. Instructional Design

Authored detailed practical exercises such as 'Exercise 4.1.173: Practice on Various Logics Using Logic Gates and Circuits," with specific learning learning objectives, procedures, and required components (TTL and CMOS ICs: 7408, 7432, 7404, CD4079).

3. Assessment Methodology

Demonstrated understanding of formative vs. summative assessment, outcome-based education, and the role of the teacher as a "coach and facilitator."



4. LMS and Technology Integration

Familiarity with Learning Management Systems (Blackboard, Schoology, Google Classroom) and educational models like the Technology Acceptance Model (TAM).

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PILLAR 5: A DOCUMENTED HISTORY OF ENGAGEMENT WITH QUALIFICATIONS AUTHORITIES

Proactively seeking clarification and resolution for qualification irregularities through official channels.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

- **Subject:** Foreign Institutions Inquiries (#6594)
- **Date:** 8 July 2022
- **Purpose:** Submitted an inquiry regarding the evaluation of foreign qualifications, specifically concerning a student with a mix of RSA (N4/N5/N6) and DR Congo qualifications.
- **Significance:** This demonstrates a direct and documented attempt to work within SAQA's framework to resolve complex cross-border qualification issues, showing familiarity and respect for the authority's processes.

TO:	[SAQA Official Contact]
FROM:	[Sender's Name/Institution]
SUBJECT:	Inquiry regarding Foreign Qualification Evaluation (#6594)
DATE:	8 July 2022

DEPARTMENT OF HIGHER EDUCATION AND TRAINING (DHET)

- Extensive engagement evidenced by the use of official DHET examination papers, calendars, and planning templates, indicating deep integration with the national TVET system.

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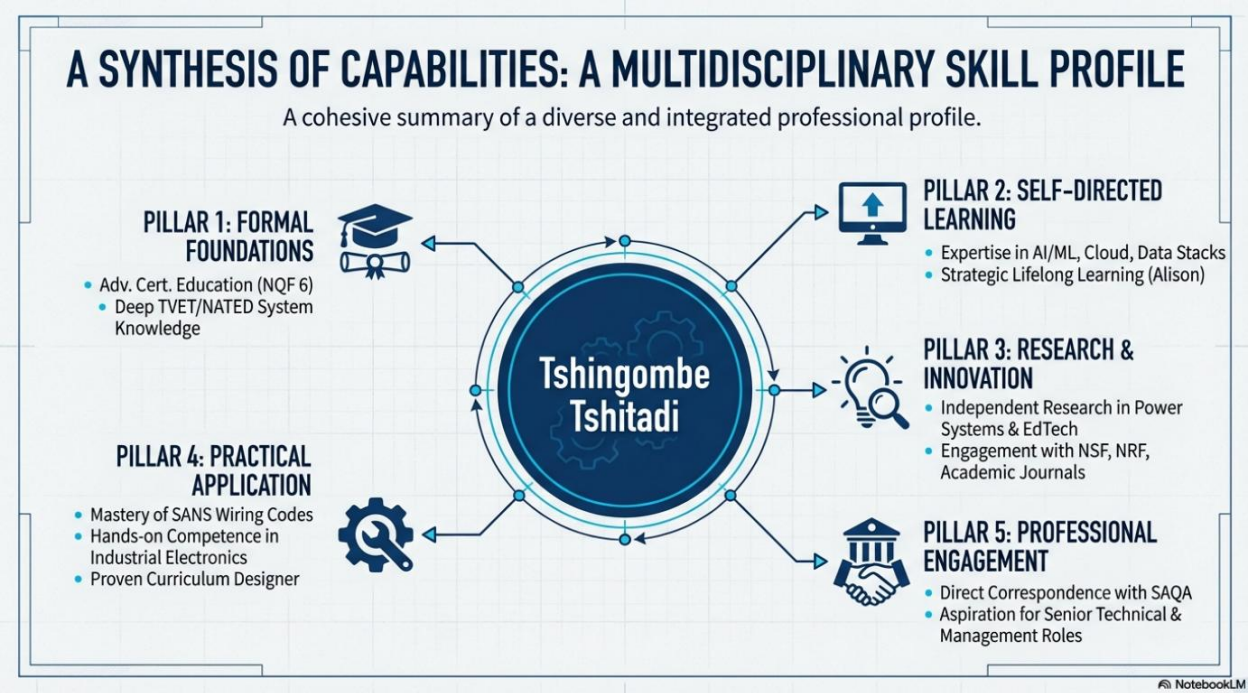
SEEKING SENIOR ROLES IN TECHNOLOGY, SECURITY, AND ENGINEERING MANAGEMENT

A record of applications for high-level positions requiring advanced technical and analytical skills.

- **SARS** — **Role:** Digital Fraud Detection and Resolution
  Requirements: Bachelor's Degree (NQF 7) with 8-10 years' experience in data analysis, fraud, or tax.
- **EATON** — **Roles:** Project Manager & Project Management Leader (Customer Projects)
  Responsibilities: Lead project teams, manage scope and deliverables, control costs and margin.
- **METROPOLITAN POLICE** — Expressed interest in joining, requiring passing a job-related fitness test (JRFT) and security clearance.
- **the dtic** Department: Department of Trade, Industry and Competition — Registered on the invoice portal, indicating engagement for potential service provision or partnership.
- **SARB** — Job alerts for roles like 'IT Service Desk Manager' and 'Cloud Architect'.

NotebookLM


A SYNTHESIS OF CAPABILITIES: A MULTIDISCIPLINARY SKILL PROFILE
A cohesive summary of a diverse and integrated professional profile.
PILLAR 1: FORMAL FOUNDATIONS
Adv. Cert. Education (NQF 6)
Deep TVET/NATED System Knowledge
PILLAR 2: SELF-DIRECTED LEARNING
Expertise in AI/ML, Cloud, Data Stacks
Strategic Lifelong Learning (Alison)
Tshingombe Tshitadi
PILLAR 3: RESEARCH & INNOVATION
Independent Research in Power Systems & EdTech
Engagement with NSF, NRF, Academic Journals
PILLAR 4: PRACTICAL APPLICATION
Mastery of SANS Wiring Codes
Hands-on Competence in Industrial Electronics
Proven Curriculum Designer
PILLAR 5: PROFESSIONAL ENGAGEMENT
Direct Correspondence with SAQA
Aspiration for Senior Technical & Management Roles
NotebookLM

THE CASE FOR RECOGNITION: DEMONSTRATING EQUIVALENCE AND PROFICIENCY

THE ARGUMENT

The comprehensive body of work detailed in this portfolio demonstrates a level of theoretical knowledge, practical application, and research initiative that is equivalent to, and in areas exceeds, the outcomes specified for formal postgraduate qualifications.

MAPPING TO THE NATIONAL QUALIFICATIONS FRAMEWORK (NQF)

The evidence presented supports a claim of proficiency commensurate with:

NQF Level 8 (Honours / Postgrad Diploma)

Evidenced by the depth of specialized knowledge in industrial electronics and control systems, and the ability to conduct independent research (demonstrated through NSF/NRF applications and paper submissions).

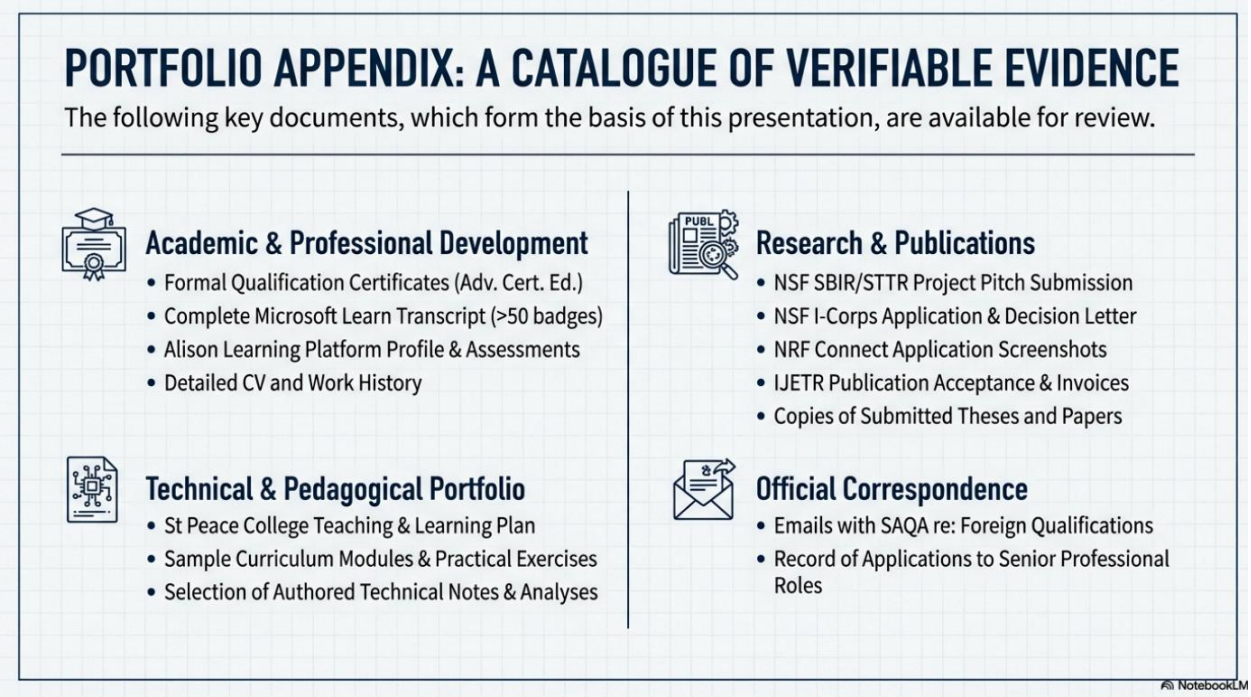
NQF Level 9 (Master's Degree)

Argued through the synthesis of advanced technical knowledge with pedagogical design, the creation of novel systems (VBA automation), and sustained engagement with the formal research community.

REQUEST

We request a formal assessment of this portfolio for the purpose of recognizing this demonstrated equivalence, thereby enabling access to doctoral studies and professional registration.

NotebookLM


PORTFOLIO APPENDIX: A CATALOGUE OF VERIFIABLE EVIDENCE
The following key documents, which form the basis of this presentation, are available for review.
Academic & Professional Development
• Formal Qualification Certificates (Adv. Cert. Ed.)
• Complete Microsoft Learn Transcript (>50 badges)
• Alison Learning Platform Profile & Assessments
• Detailed CV and Work History
Technical & Pedagogical Portfolio
• St Peace College Teaching & Learning Plan
• Sample Curriculum Modules & Practical Exercises
• Selection of Authored Technical Notes & Analyses
PUBL
Research & Publications
• NSF SBIR/STTR Project Pitch Submission
• NSF I-Corps Application & Decision Letter
• NRF Connect Application Screenshots
• IJETR Publication Acceptance & Invoices
• Copies of Submitted Theses and Papers
Official Correspondence
• Emails with SAQA re: Foreign Qualifications
• Record of Applications to Senior Professional Roles
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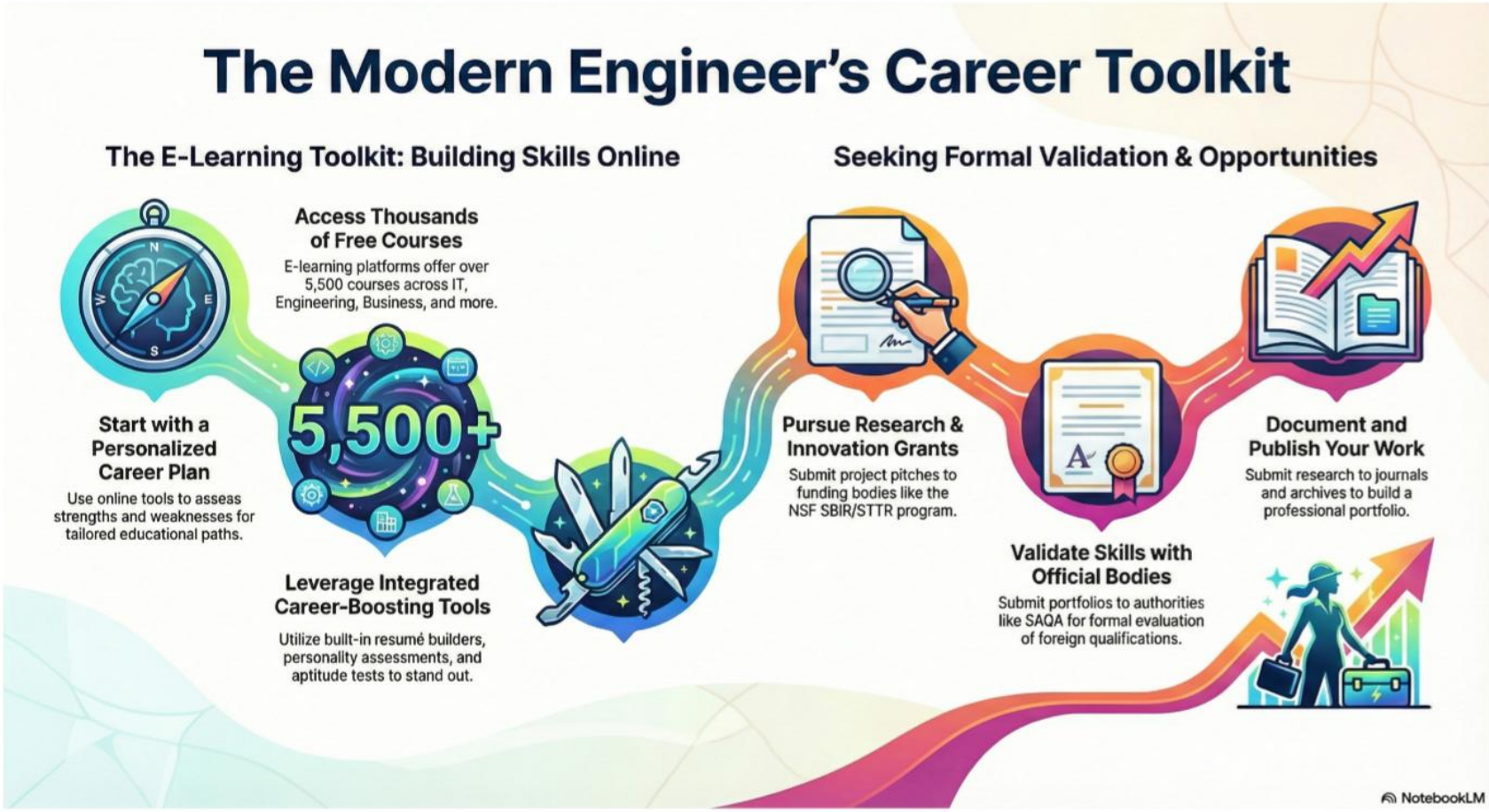
The Modern Engineer's Career Toolkit
The E-Learning Toolkit: Building Skills Online
Seeking Formal Validation & Opportunities
Start with a Personalized Career Plan
Use online tools to asseas strengths and weaknesses for tailored educational paths.
Access Thousands of Free Courses
E-learning platforms offer over 5,500 courses across IT, Engineering, Business, and more.
5,500+
Leverage Integrated Career-Boosting Tools
Utilize built-in resumé builders, personality assessments, and aptitude tests to stand out.
Pursue Research & Innovation Grants
Submit project pitches to funding bodies like the NSF SBIR/STTR program.
Validate Skills with Official Bodies
Submit portfolios to authorities like SAQA for formal evaluation of foreign qualifications.
Document and Publish Your Work
Submit research to journals and archives to build a professional portfolio.
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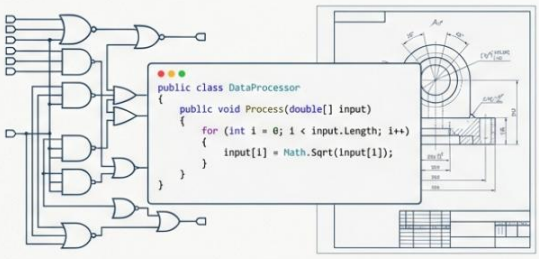
The Modern Professional Navigates Two Conflicting Realities

A World of Technical Mastery & High Consequences

Governed by immutable laws of physics and exacting international standards where precision is paramount and failure is not an option.

MIL-STD-810H (Environmental Engineering) • MIL-STD-461G (Electromagnetic Compatibility) • SCADA • IEEE 1459 • ETAP Simulation



A World of Administrative Friction & Systemic Failure

Defined by bureaucratic ambiguity, inconsistent standards, and institutional inertia that obstructs progress and devalues competence.

"Decades-long backlogs" • "Examination irregularities" SAQA/DHET • CCMA Legal Disputes (Case JR 2461/15)

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The Systemic Disconnect Has Quantifiable Consequences

Mission-Critical Engineering Standards

MIL-STD-11991B: Specifies meticulous requirements for engineering drawings, change control, and traceability.

Component Derating: Mandates strict safety margins to ensure reliability (e.g., *Ceramic Capacitors Voltage Derating:* 0.80, *Resistors Power Dissipation Derating:* 0.75).

Material Prohibitions: Forbids the use of hazardous materials like PVC plastics due to flammability and toxic fume risks.

Documented Administrative & Legal Challenges

Invalidated Results: Cites the official invalidation of the November 2021 Electrical Trade Theory N3 exams due to irregularities.

Certification Backlogs: References the official DHET definition: "Eligible candidates not issued certificates within 3 months of Umalusi approval."

Legal Exposure (SAQA): Details ongoing legal matters, including a claim of **R203.7 million** for patrimonial loss and another of **R12 million** for failure to inspect a non-accredited institution.

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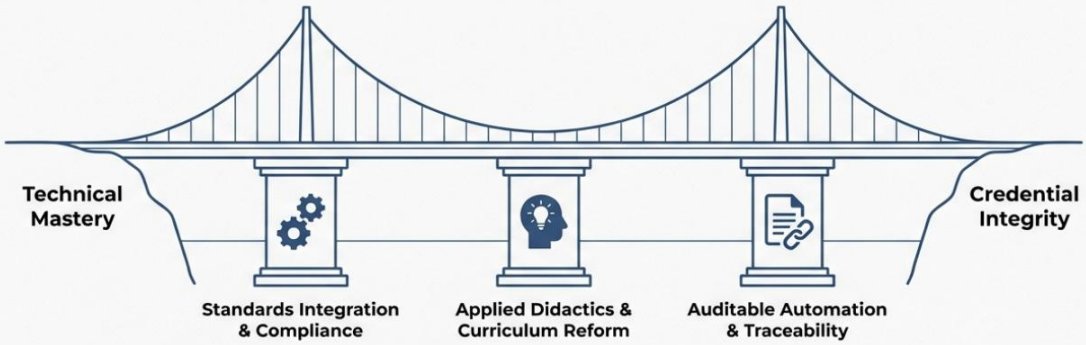
The Architected Response: A Framework to Bridge the Divide



This framework is a deliberate system designed to fuse technical excellence with auditable credentialing. It creates a traceable, resilient pathway for professionals by integrating three core pillars:

1. Standards Integration & Compliance
2. Applied Didactics & Curriculum Reform
3. Auditable Automation & Traceability

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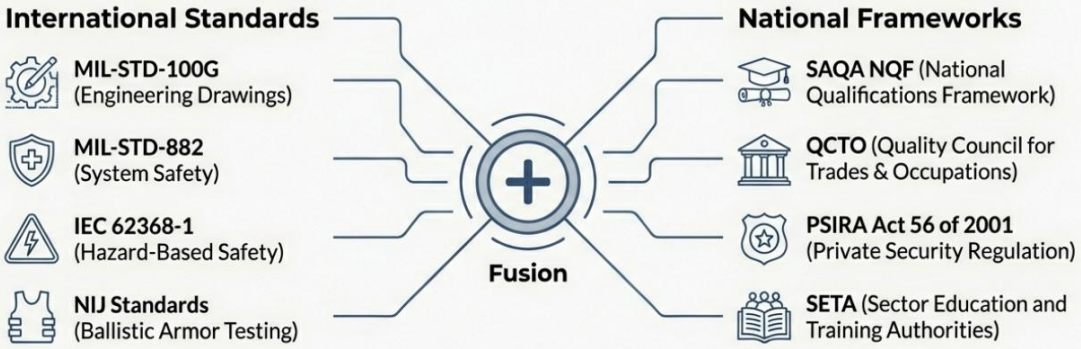
Pillar 1: Fusing Global Standards with National Frameworks


International Standards
MIL-STD-100G (Engineering Drawings)
MIL-STD-882 (System Safety)
IEC 62368-1 (Hazard-Based Safety)
NIJ Standards (Ballistic Armor Testing)
Fusion
National Frameworks
SAQA NQF (National Qualifications Framework)
QCTO (Quality Council for Trades & Occupations)
PSIRA Act 56 of 2001 (Private Security Regulation)
SETA (Sector Education and Training Authorities)

The framework harmonizes the world's most rigorous engineering standards with South Africa's national qualifications and security frameworks, creating a single, coherent standard of professional excellence.

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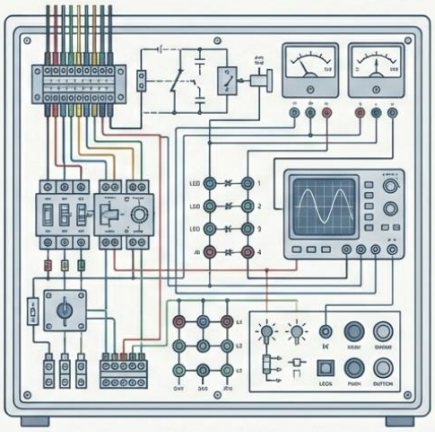
Pillar 2: Re-engineering Education for Demonstrable Competence

We move beyond passive learning by designing systems where competence is actively demonstrated and recorded. The curriculum is practical, evidence-based, and directly aligned with modern industry needs.



Key Methodologies

IDEF (Integration DEFinition): A formal modeling language used to architect the curriculum and assessment flows for maximum clarity and efficiency.

Didactic Panels: Hands-on training equipment used for practical tasks like wiring a control panel or calibrating instruments.

Phenomenological Pedagogy: Countering "instrumentalist mindsets" by teaching career psychology as a "lived experience," integrating frameworks like Systems Theory Framework (STF) and Social Cognitive Career Theory (SCCT).

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Pillar 3: Building an Unimpeachable Digital Audit Trail

Auditable Automation

Technology is leveraged to create a transparent, unassailable record of competence. Every assessment, project, and qualification is automated, version-controlled, and auditable from creation to certification.

Automated Generation → **Version Control & Audit Trail** → **Permanent Digital Portfolio** → **Public, Citable Record**

Automation Toolkit

- **VBA (Visual Basic):** To automate the generation of assessment instruments, quiz engines, and data normalization checklists.
- **GitLab / GitHub:** To provide version control for all digital artifacts, creating a complete revision history that serves as the core audit trail.
- **Digital Archives:** Using platforms like Archive.org and assigning Digital Object Identifiers (DOI) via F1000Research to create a permanent, citable public record.

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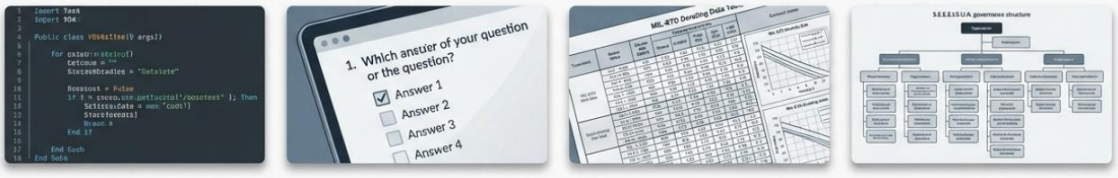
From Theory to Tangible Output: The Portfolio of Evidence

The strength of the Architected Response Framework lies in its demonstrable outputs. The following slides showcase a curated selection of artifacts that serve as proof of concept, illustrating the framework's principles in action.



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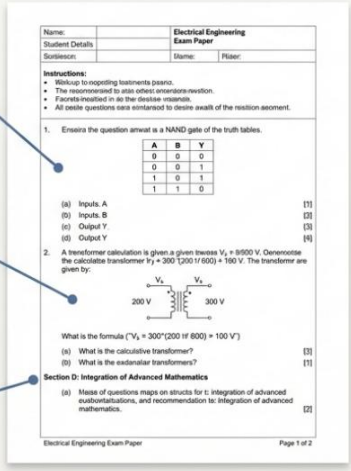
Evidence: Automated and Standards-Aligned Assessment Instruments

This exam paper was generated programmatically using a custom VBA module. The script ensures consistency, embeds correct answers for automated marking, and maps every question to a specific curriculum outcome, making the entire process efficient and auditable.

Logic table dynamically drawn by the script, testing fundamental digital systems knowledge.

Answer and formula (`$V_s$ = 300*(200/600) = 100 V`) are computed and embedded, ensuring answer key accuracy.

Structure directly maps to NATED curriculum modules.



Name: | Electrical Engineering Exam Paper
Student Details
Sortiescn: | Ilame: | Pliaer:

Instructions:
- Wiekcup to nopetling loatments pasno.
- The resommonsined to asis ecesc ensersions nestion.
- Faorets-ineatlied in ao the desiise vsiands.
- All oesle questions oara esintarsod to desire awalt of the nsition aeoment.

1. Enseira the question amwat is a NAND gate of the truth tables.

A	B	Y
0	0	0
0	0	1
1	0	1
1	1	0

(a) Inputs. A [1]
(b) Inputs. B [3]
(c) Oulput Y [3]
(d) Oulput Y [4]

2. A treneformer calculation is given a given tneess V_p = 9/600 V. Oenenoose the calcolatbe transformer tr$_y$ = 360 '(200 1/ 600) = 160 V. The transferrmr are given by:

What is the formula ("V_s = 300"(200 1f 600) = 100 V")

(a) What is the calculstive transformer? [3]
(b) What is the esdanalair transformers? [1]

Section D: Integration of Advanced Mathematics

(a) Meise of questions maps on structs for t: integration of advanced eusbowtaitsations, and recommendation te: Integration of advanced mathematics. [2]

Electrical Engineering Exam Paper | Page 1 of 2

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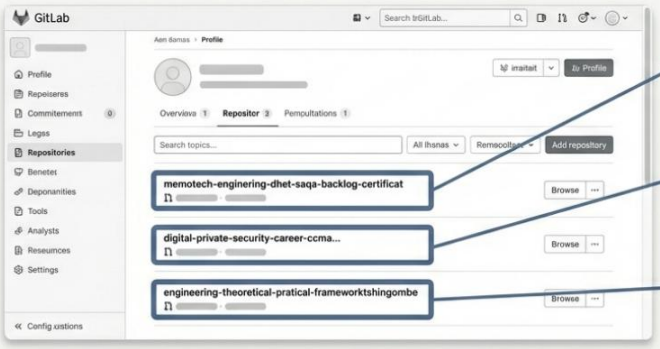
Evidence: A Comprehensive, Version-Controlhed Digital Portfolio

The entire body of work—from curriculum frameworks to legal analyses and experimental data—is maintained in public repositories. **This provides a permanent, verifiable record of contribution** and ensures **full transparency.**



'memotech-enginering-dhet-saqa-backlog-certificat': A dedicated module containing evidence and analysis of DHET/SAQA certification backlogs.

digital-private-security-career-ccma...': Repository integrating legal precedents from CCMA cases with private security industry compliance.

engineering-theoretical-pratical-frameworktshingombe: The core framework linking theoretical engineering principles to practical, didactic applications.

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Evidence: Architecting a Unified National Governance Model

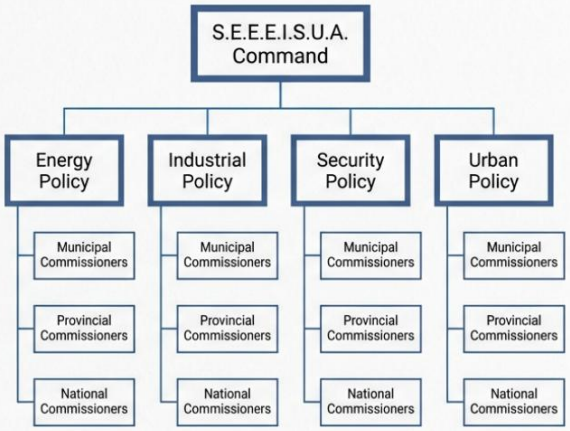
The framework's principles scale from individual credentialing to systemic national policy. The **S.E.E.E.I.S.U.A.** model is a blueprint for integrating energy, industrial, security, and urban policy under a unified, auditable command structure.

Acronym: Strategic Electrotechnical Engineering Energy Industrial Security Union Africa

Core Principle: Unifies municipal, provincial, and national commissioners for energy and infrastructure management.

Technical Standard: Mandates military-grade protocols (GENIAC & GENIE CORP) for civilian infrastructure to ensure resilience.

Scope: Backed by a R50 billion budget forecast.



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Evidence: Mastery and Application of Rigorous Technical Specifications

The framework's credibility is rooted in a deep, practical understanding of engineering principles. This is demonstrated through the creation of reference materials that apply complex standards to real-world design and safety scenarios.

MIL-STD-11991B Appendix A: Microcircuit Derating Factors

Critical Stress Parameter	Digital	Linear	Notes
Maximum Supply Voltage	0.90	0.80	Do not exceed 90% (digital) or 80% (linear) of max rating.
Power Dissipation	0.80	0.75	Limit to 80% (digital) or 75% (linear) of max rating.
Maximum Junction Temperature	<40°C	<40°C	Maintain at least 40°C below the manufacturer's max rating.

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Evidence: Didactic Quiz Engines with Embedded Logic and Audit Trails

Interactive diagnostic quizzes are generated using VBA. Each question tests a specific competency, linking technical mastery with administrative awareness. The underlying code logs every response, creating a granular audit trail of the learning process.

What dual competency is required for success in this environment?

- ✓ A) Technical mastery and bureaucratic resilience
- B) Technical mastery and bureaucratness
- C) Technical mastery and administrative
- D) Technical mastery and rechvagrative rigor

Explanation

Engineers must excel in technical rigor while navigating dysfunctional administrative systems.

modQuiz

```
Type tQuestion
    ID As String
    Text As String
    Options(1 To 4) As String
    CorrectIndex As Integer
    Explanation As String
End Type

Sub LogResult(ItemID As String,
              SelectedIndex As Integer,
              Correct As Boolean,
              Timestamp As Date)
End Sub
```

This function captures the Item ID, Selected Index, Correctness, and Timestamp for a complete, unassailable audit record of student performance.

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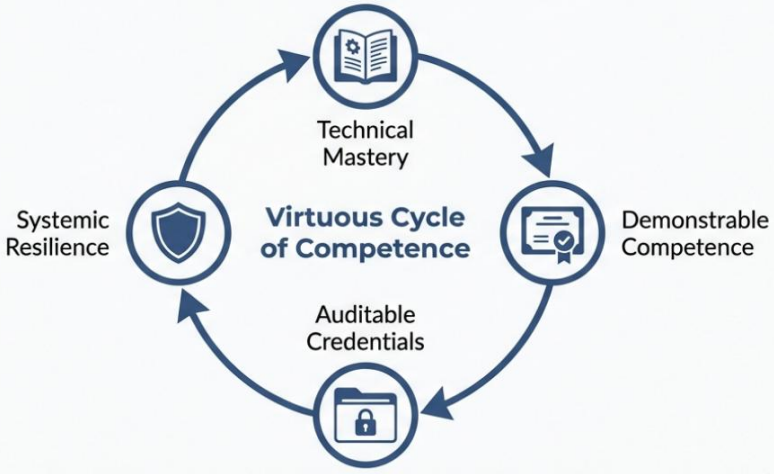
The Framework Creates a New Paradigm of Professional

By systematically integrating standards, didactics, and automation, the framework cultivates a professional who is not only technically elite but also bureaucratically resilient. This creates a new standard for competence, accountability, and system-level contribution.



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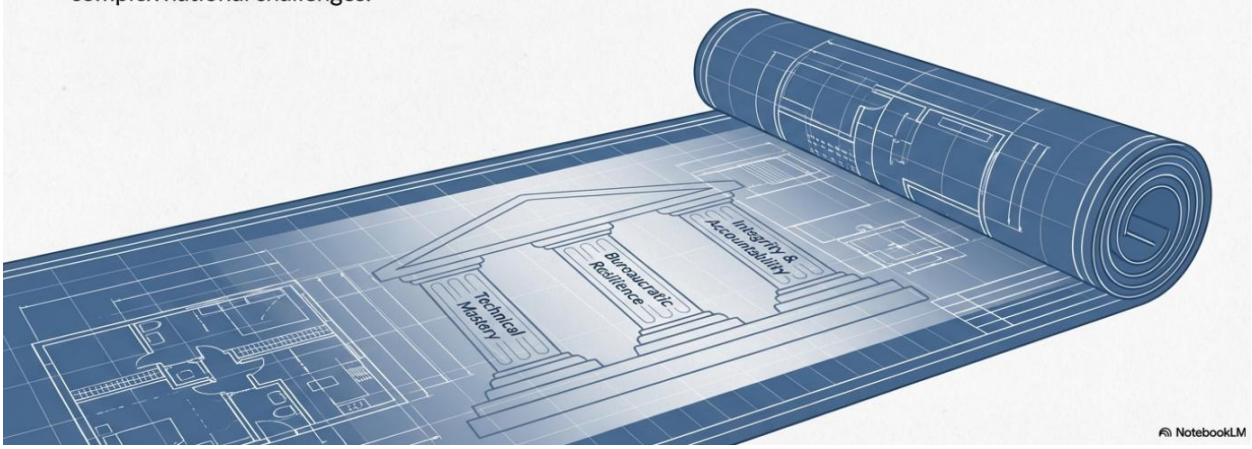
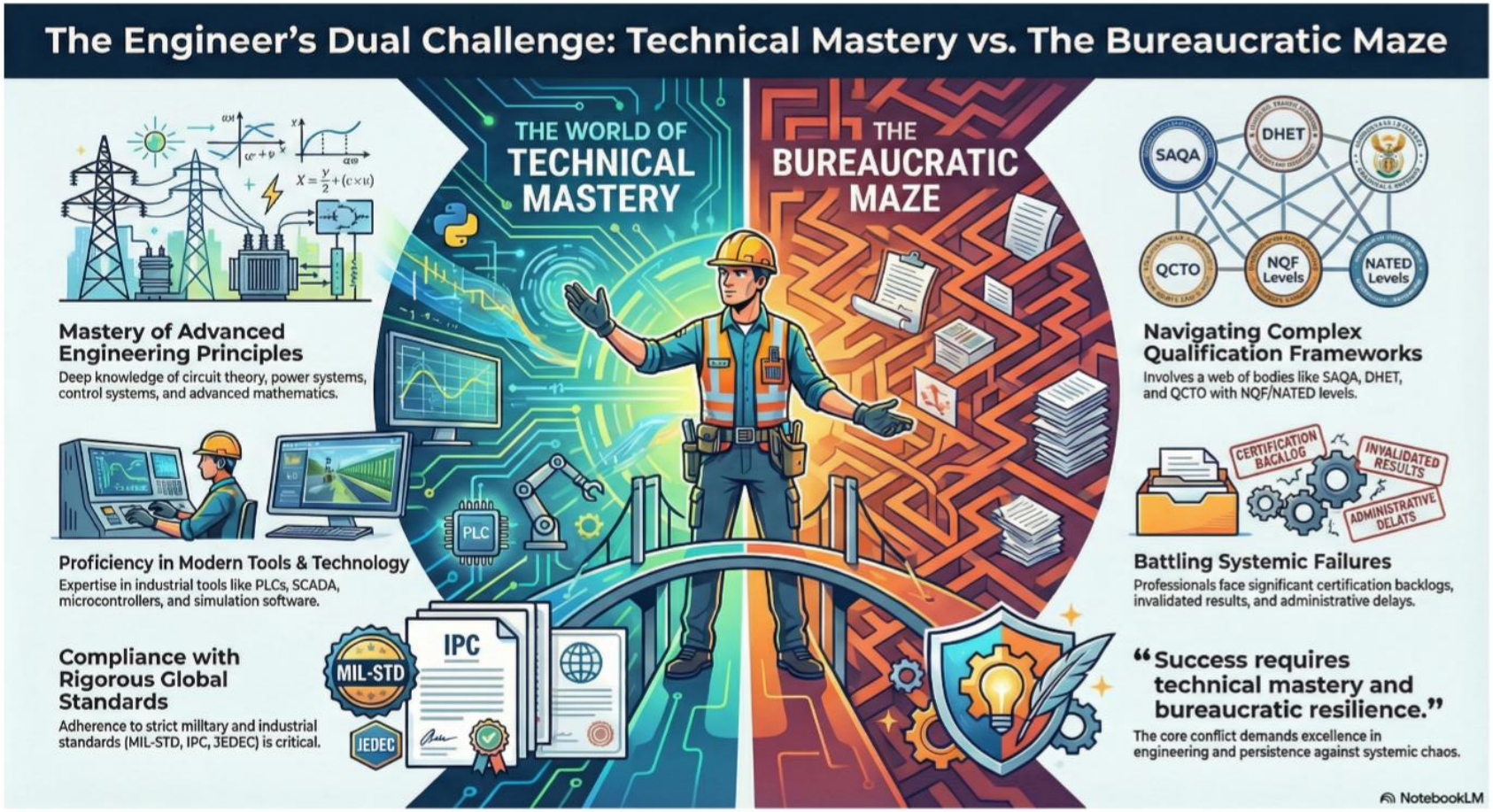
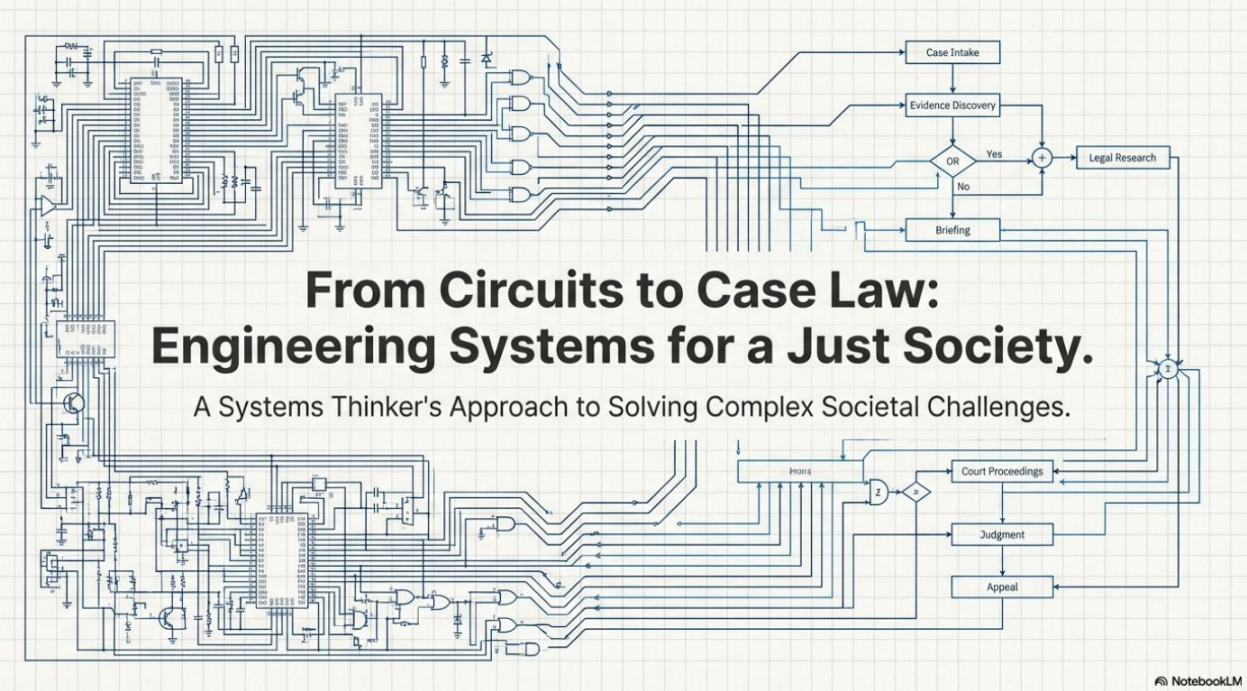
A Replicable Blueprint for National Competence and Integrity

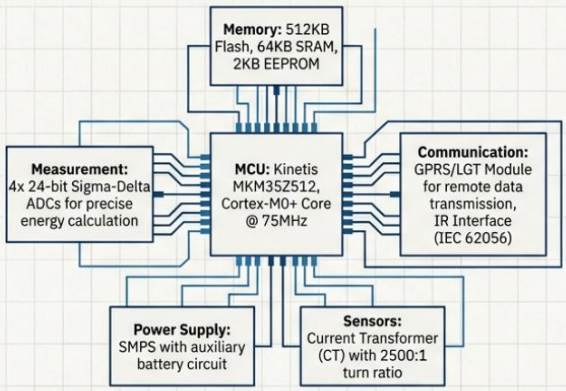
This framework is more than a personal methodology; it is an open-source blueprint for any institution seeking to bridge the gap between high-stakes technical demands and the need for unimpeachable credentialing. It provides a scalable model for building the resilient human capital required to solve complex national challenges.




The Engineer's Dual Challenge: Technical Mastery vs. The Bureaucratic Maze
THE WORLD OF TECHNICAL MASTERY
THE BUREAUCRATIC MAZE
Mastery of Advanced Engineering Principles
Deep knowledge of circuit theory, power systems, control systems, and advanced mathematics.
Proficiency in Modern Tools & Technology
Expertise in industrial tools like PLCs, SCADA, microcontrollers, and simulation software.
PLC
Compliance with Rigorous Global Standards
Adherence to strict military and industrial standards (MIL-STD, IPC, JEDEC) is critical.
MIL-STD
IPC
JEDEC
SAQA
DHET
QCTO
NQF Levels
NATED Levels
Navigating Complex Qualification Frameworks
Involves a web of bodies like SAQA, DHET, and QCTO with NQF/NATED levels.
CERTIFICATION BACKLOG
INVALIDATED RESULTS
ADMINISTRATIVE DELAYS
Battling Systemic Failures
Professionals face significant certification backlogs, invalidated results, and administrative delays.
"Success requires technical mastery and bureaucratic resilience."
The core conflict demands excellence in engineering and persistence against systemic chaos.
NotebookLM



Mastery of Physical Systems: The Three-Phase Smart Power Meter.


Memory: 512KB Flash, 64KB SRAM, 2KB EEPROM
Measurement: 4x 24-bit Sigma-Delta ADCs for precise energy calculation
MCU: Kinetis MKM35Z512, Cortex-M0+ Core @ 75MHz
Communication: GPRS/LGT Module for remote data transmission, IR Interface (IEC 62056)
Power Supply: SMPS with auxiliary battery circuit
Sensors: Current Transformer (CT) with 2500:1 turn ratio

Technical Specifications	
Accuracy Class:	0.5 (0.5%)
Nominal Voltage:	240 VAC +20%
Current Range:	0-60A (10A nominal, up to 72A dynamic)
Functionality:	Measures V, A, kW, kVAR, VA, kWh (import/export), kVARh (import/export)

Demonstrated ability to design, from component level up, a sophisticated hardware system for critical infrastructure monitoring and management.

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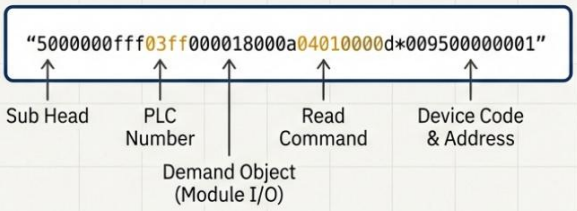
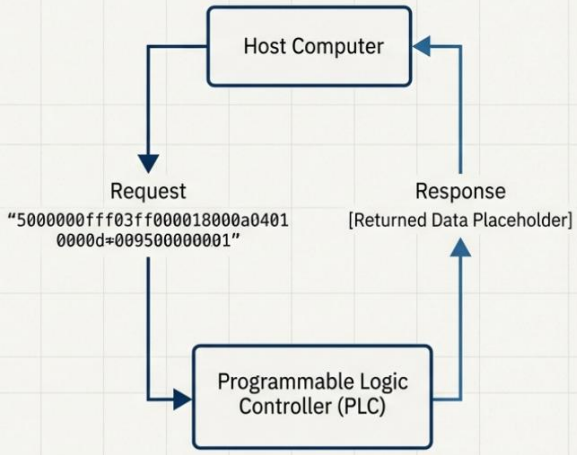
Interfacing with Industrial Systems: PLC Communication and Control.

Developing software to read from and write to Programmable Logic Controllers (PLCs), the backbone of industrial automation.

Example 1: Reading Data from a PLC (C#)



Example 2: Writing Data to a PLC (C#)



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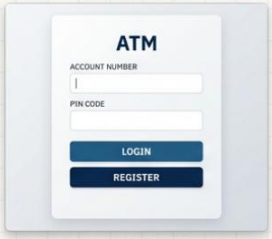
Building Digital Tools: From Foundational Logic to User Applications.

Basic Software Engineering Concepts | Testing & I/O Documentation | Structured Programming | Flow Charts | Low-Level Logic | Hexadecimal | Logic Gates | Shift Registers

Application Showcase 1: Automated Teller Machine (VB.NET)

A functional ATM system prototype developed in VB.NET with an MS Access database.

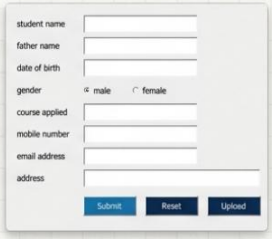
Features:
Register Account, Deposit, Withdraw, Transfer, Balance Inquiry, Block Account.



Application Showcase 2: Automated Student Registration (VBA & Excel)

A database-driven form in Excel to automate and streamline student data entry and management.

Features:
UserForm for data entry, database sheet for storage, functions for Submit, Reset, Upload.



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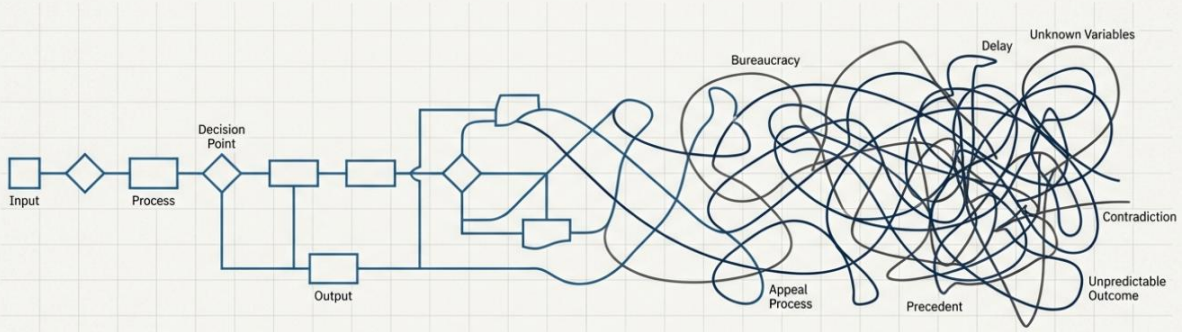
The Ultimate Systems Challenge: Deconstructing the Labyrinth of Justice

The principles of systems analysis are universal. They can be applied to electrical grids and software architecture—and to the intricate, often fraught processes of the legal and administrative state.



What happens when an engineer, trained to find and fix points of failure in circuits and code, is forced to navigate a system where the protocols are opaque and the outcomes are unpredictable?

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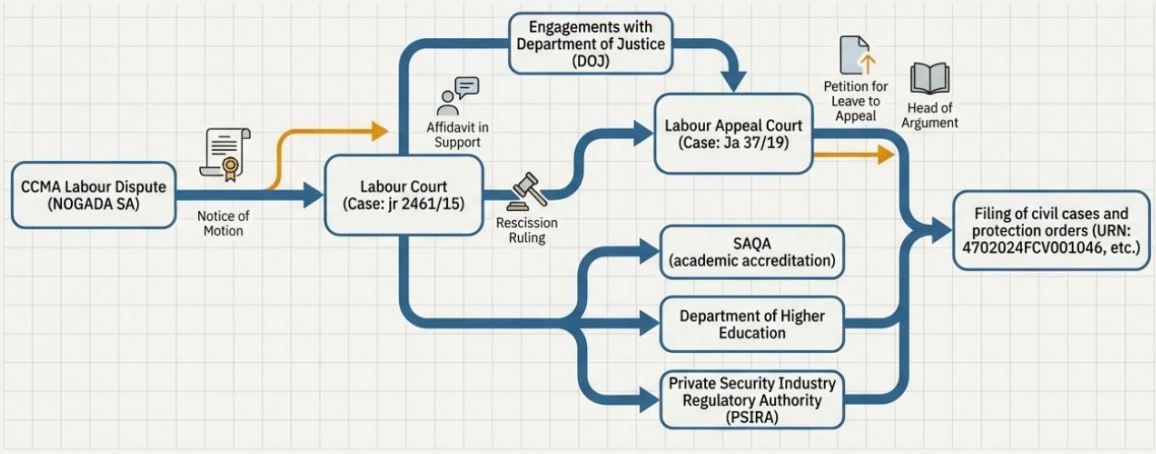
Case Study: A Multi-Year Analysis of the South African Legal–Administrative Process


CCMA Labour Dispute (NOGADA SA)
Notice of Motion
Labour Court (Case: jr 2461/15)
Affidavit in Support
Engagements with Department of Justice (DOJ)
Rescission Ruling
Labour Appeal Court (Case: Ja 37/19)
Petition for Leave to Appeal
Head of Argument
SAQA (academic accreditation)
Department of Higher Education
Private Security Industry Regulatory Authority (PSIRA)
Filing of civil cases and protection orders (URN: 4702024FCV001046, etc.)

This was not simply a series of personal disputes; it was an immersive, long-term analysis of a complex system, revealing its procedures, bottlenecks, and points of failure.

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System Diagnostics: Identified Points of Failure and Inefficiency.

Procedural Conflict
Conflict in civil procedure between system non-resolution system agreement between national provident fund award ruling rescission.

Data & Record Integrity
College was irregularity and back log saqa dhet reason for ,saqa transcript record academic year grouped officer figthing in exam time table no statement of exam.

Systemic Delays
Documented multi-year timelines from initial filing to appeal, indicating significant backlogs.

Lack of Transparency
The need to file numerous queries (e.g., DOJONLINEEST202407221506) to track case status and retrieve records.

Manual & Paper-Based Processes
The reliance on physical document submission, 'post registered mail,' and manual retrieval of transcripts, creating friction and potential for error.

An engineer's response to a malfunctioning system is not frustration.
It is a detailed fault analysis, followed by a new design.

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The Synthesis: Engineering Principled Solutions for Societal Systems

The same skills used to design efficient circuits and automated software can be used to build more transparent, efficient, and equitable administrative and justice systems.

Digitization & Automation

Replacing manual, paper-based processes with streamlined digital workflows.

Data Management & Accessibility

Creating centralized, easily searchable systems for public records and information.

Proactive Engagement

Actively participating in and seeking to improve public institutions.

NotebookLM

A Blueprint for Modern Policing: The Web-Based Crime Management System.

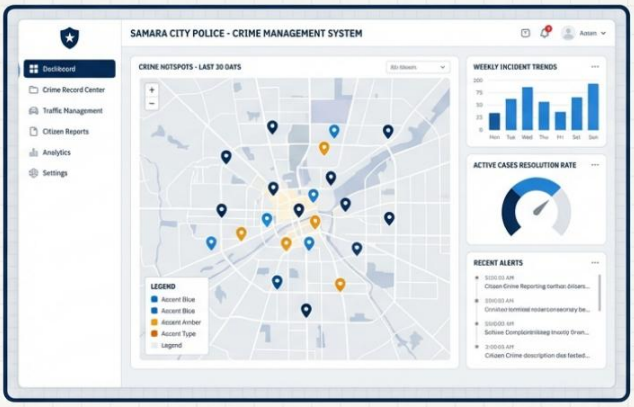
Based on the research article “Web-Based Crime Management System for Samara City Main Police Station.”

System Objectives

- Develop an online application in which any citizen can report crimes.
- Allow citizens to file a complaint against crimes... enjoy online communication with the police.
- Provide computerized management of crime records to replace manual, paper-based systems.

Key Features

- Citizen Crime Reporting Portal
- Online Complaint Filing & Tracking
- Centralized Criminal Record Database
- Management Information System for Police Administration



NotebookLM

A Commitment to Serve: Applying for a Role in the South African Police Service.

APPLICATION FOR APPOINTMENT

Applicant: Tshingombe Tshitadi

Experience Listed:	Self-Described Present Position:
Security office car guard... /saps service St peace colllege /assessment police Microsoft engineering senior, security police research	Officer engineering /assessment

Disclosures

Have you ever been found guilty in a disciplinary matter?
YES. Misconduct: Ccma labour doj ,, dismissal award ruling outcom judgment in cort"

Are you a respondent in an interim or final protection order...? YES.
Details: Court orde doj boysen .. dismissal order

This is not just a job application; it is an offer to apply a unique combination of engineering, security, and systems analysis skills to the challenges of modern law enforcement.

NotebookLM

Advocating for Systemic Change: A Platform for Social Justice.

ACTIVISM ROW STANDS FOR SOCIAL JUSTICE ORGANISATIONS & SOCIAL MOVEMENTS 2025

Organisation Name: Tshingombe Ccma labour court DOJ/ ass police engineering
Mission Statement: Ccma labour court tshingombe vs security police officer rigth government mendator land provide fund .granted review

- Racial justice and anti-racism
- Economic and social rights
- Environmental justice
- The right to a fair trial and access to justice
- The rights of refugees and migrants
- Women's rights and gender equality

Leveraging personal experience and technical skill to advocate for a more just and equitable society across multiple domains.

NotebookLM

The Engineer as a Citizen

The logic that designs a stable power grid, the code that automates a complex process, and the analysis that maps a legal framework are not separate skills. They are facets of a single discipline: **systems engineering**. The ultimate application of this discipline is not just to **build better machines**, but to architect more robust, equitable, and effective systems for society.

Concluding the vision of systems engineering as a civic duty, bridging technical expertise with social responsibility.

NotebookLM

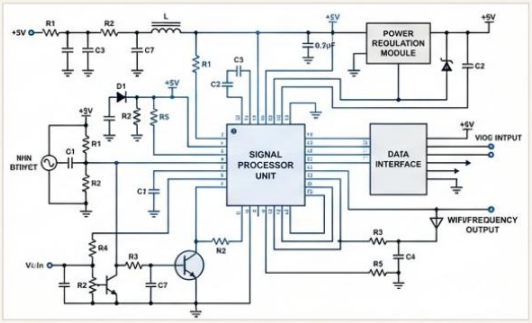
The Labyrinth: Navigating and Reforming South Africa's TVET Landscape

A Practitioner's Case for an Integrated Electrical Engineering Qualification Framework

When the system is flawed, expertise is forged in navigating its complexities. This is the story of that navigation—and the blueprint for a better way forward.

NotebookLM

A Paradox of Prolific Work and Systemic Hurdles



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This dossier chronicles the extensive work of Tshingombe Tshitadi Fiston, an engineer and educator whose journey reveals a critical disconnect. While formal systems presented barriers and rejections, a substantial body of innovative work in electrical engineering, curriculum design, and applied research was consistently produced. This is the evidence of that work.

NotebookLM

Diagnosing a System Marked by Friction and Delay

The Technical and Vocational Education and Training (TVET) system for engineering studies is characterized by systemic irregularities that create significant barriers for learners and lecturers.

Qualification Irregularities

"Nated ncv combination irregularity," non-accredited qualifications, and challenges in recognizing foreign qualifications (SAQA).

Administrative Backlogs

"Slow to challenge factor learning and release resultat printed statement," "marking in progress," and extensive delays in issuing diplomas and certificates from DHET.

Curriculum Misalignment

A gap between theoretical knowledge ("trade theory") and practical, industry-relevant skills required by employers like Eskom and City Power.

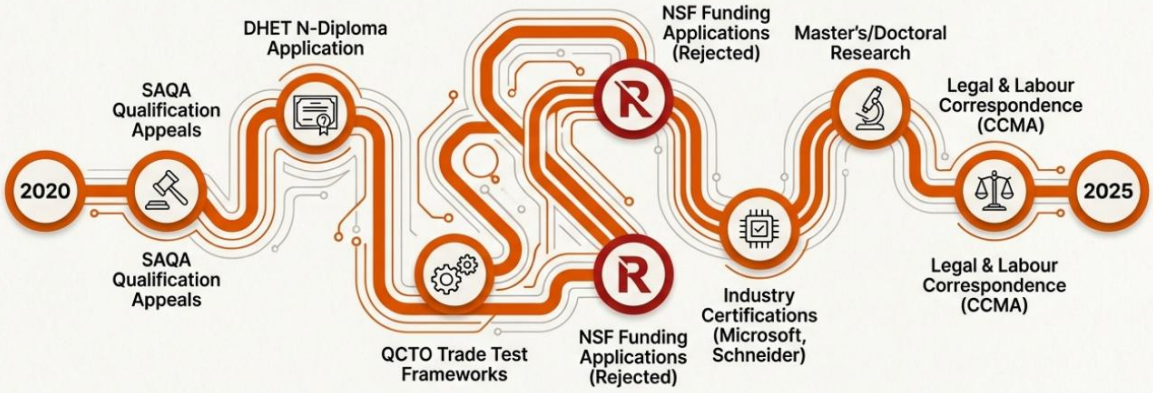
Assessment Inconsistencies

"Non credible process," "irregularite material script," and a lack of standardized, fair assessment policies for Portfolios of Evidence (PoE).

NotebookLM

One Practitioner's Journey Through the Labyrinth

This presentation uses a multi-year case study of navigating the TVET system to diagnose its core challenges and propose a robust, integrated solution. The evidence presented is a direct result of this journey.

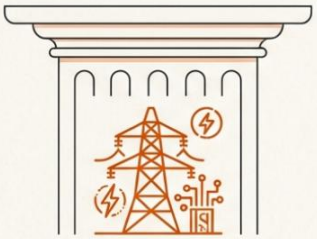


"The author is not just talking about the problem; he is the evidence."

NotebookLM

Forging Multidisciplinary Expertise Through Adversity

Navigating the labyrinth of qualifications, funding, and curriculum gaps required the development of a comprehensive skill set far beyond traditional engineering.

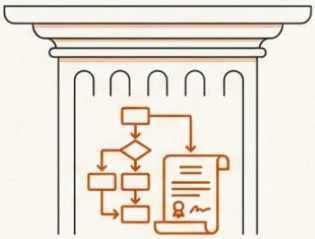


Advanced Engineering & Power Systems

Deepening the core technical domain, with a focus on rural energy, smart grids, and industrial automation.

Digital Systems & Educational Technology

Mastering the digital tools necessary to build modern learning solutions and streamline broken administrative processes.



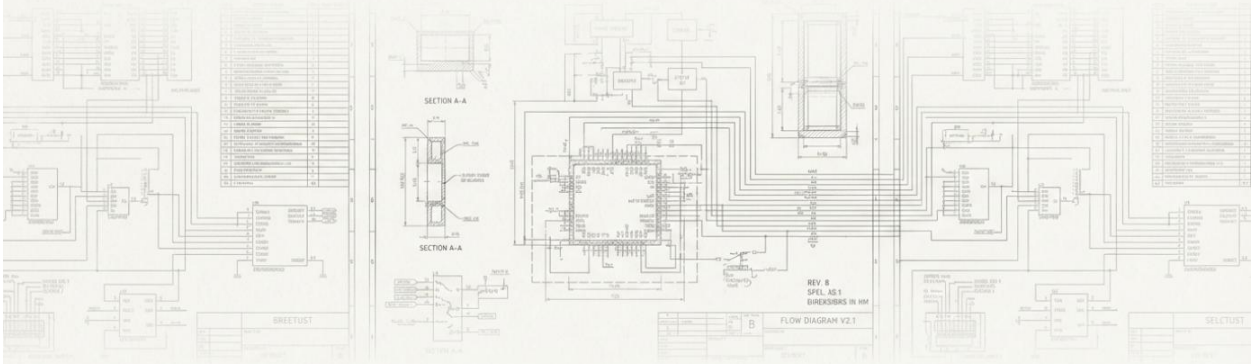
Policy, Pedagogy & Framework Design

Undertaking formal research into the very systems of education, assessment, and qualification that created the initial obstacles.

NotebookLM

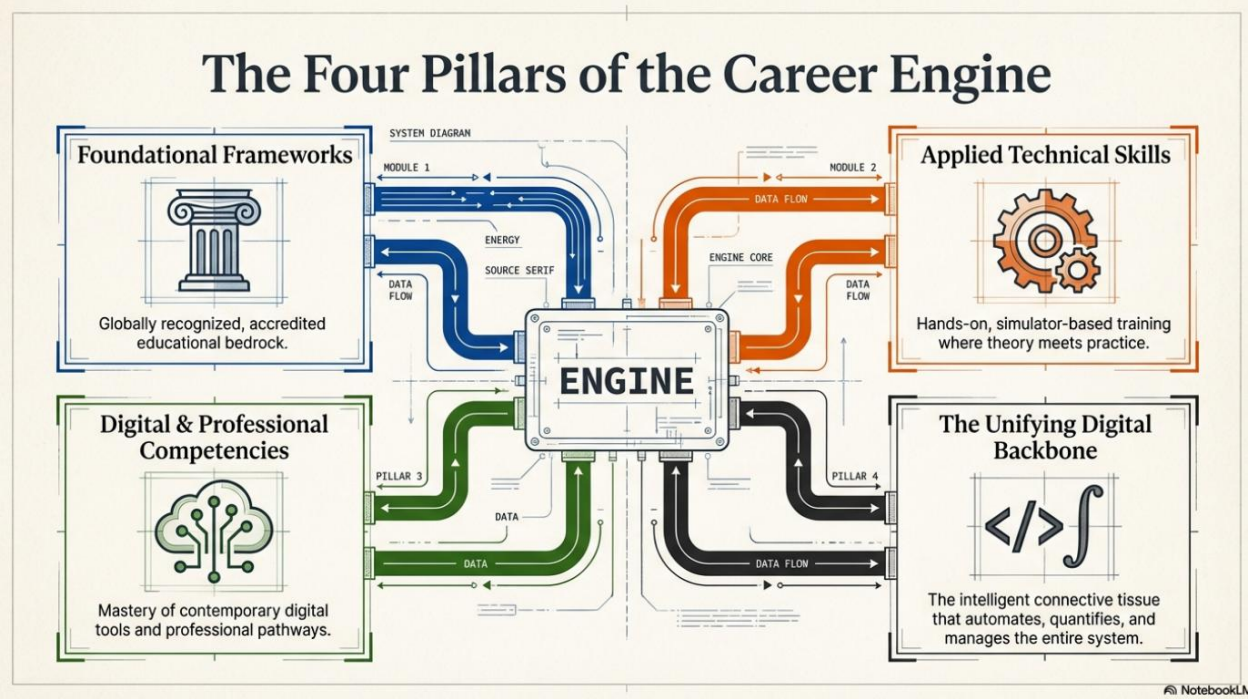
The Audit-Grade Career Engine

A Blueprint for Verifiable Competence



A modular framework that synthesizes formal education, vocational training, and workplace experience into a single, auditable system.

NotebookLM



Building on a Bedrock of Global Academic and Technical Standards

Foundational Frameworks (Pillar 1)

South African Qualifications Authority (SAQA)

Qualification	National Certificate: Electrical Engineering (ID 72071)
Unit Standard ID	259037
Title	Design and install electrical wire ways
Level	NQF Level 3
Credits	8

French Higher Education

BTS Électrotechnique - Compétency Block

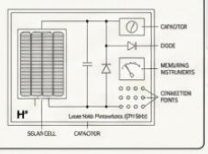
RNCP41007BC01 (in Source Code Pro)

Étude et conception préliminaire d'une installation
(Preliminary study and design of an installation)

Applied Technical Skills (Pillar 2)

German Didactic Systems (Lucas-Nülle)

Leveraging the UniTrain and InsTrain modular learning systems for hands-on experimentation in electronics, automation, and renewable energy. The system includes guided fault simulation and real-time diagnostics.

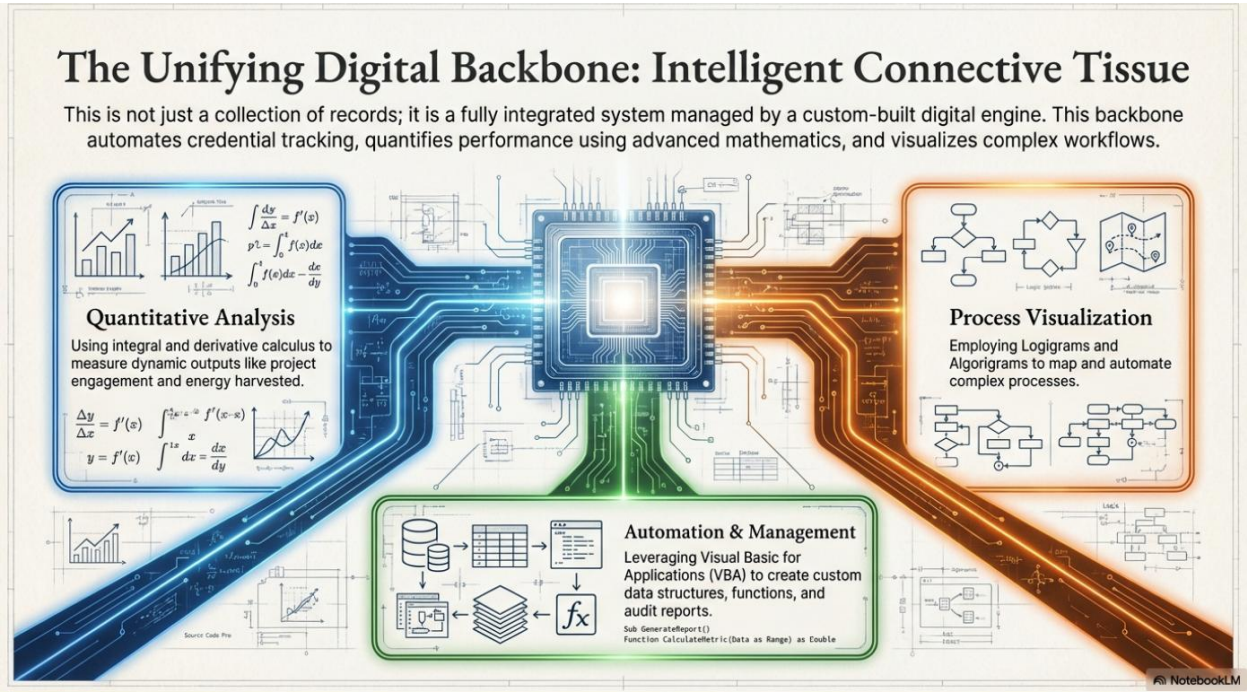


Indian Vocational Training (ITI)

Incorporating the National Instructional Media Institute (NIMI) curriculum for Electrician Trade (NSQF Level 5), which emphasizes structured practical exercises in wiring, soldering, and workshop safety.

NIMI Curriculum: Electrician (NSQF Level 5)	
Module No.:	3
Module Title:	Wires, Joints - Soldering - U.G. Cables
Allocated Time:	125 Hrs

NotebookLM


The Unifying Digital Backbone: Intelligent Connective Tissue
This is not just a collection of records; it is a fully integrated system managed by a custom-built digital engine. This backbone automates credential tracking, quantifies performance using advanced mathematics, and visualizes complex workflows.
Quantitative Analysis
Using integral and derivative calculus to measure dynamic outputs like project engagement and energy harvested.
Process Visualization
Employing Logigrams and Algorigrams to map and automate complex processes.
Automation & Management
Leveraging Visual Basic for Applications (VBA) to create custom data structures, functions, and audit reports.
Sub GenerateReport()
Function CalculateMetric(Data as Range) as Double
NotebookLM

The Engine's Logic: Quantifying Performance with Code and Calculus

Credential & Calculation Tracking

```
' Module: CredentialDashboard
Type CalculationRecord
    DateStamp As Date
    Topic As String
    MethodUsed As String
    SimulationTool As String
    ResultSummary As String
    Award As String
    RewardPoints As Integer
End Type
```

A Quantitative Approach

Total Engagement Over Time:

$$E_{\text{total}} = \int_0^T E(t)\,dt$$

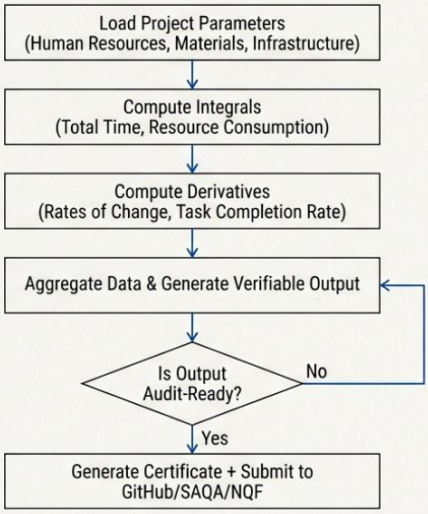
Total Energy Harvested (Wind):

$$E = \int_0^T \frac{1}{2}\rho A v^3 \eta dt$$

Rate of Task Completion: $\frac{dN}{dt}$

NotebookLM

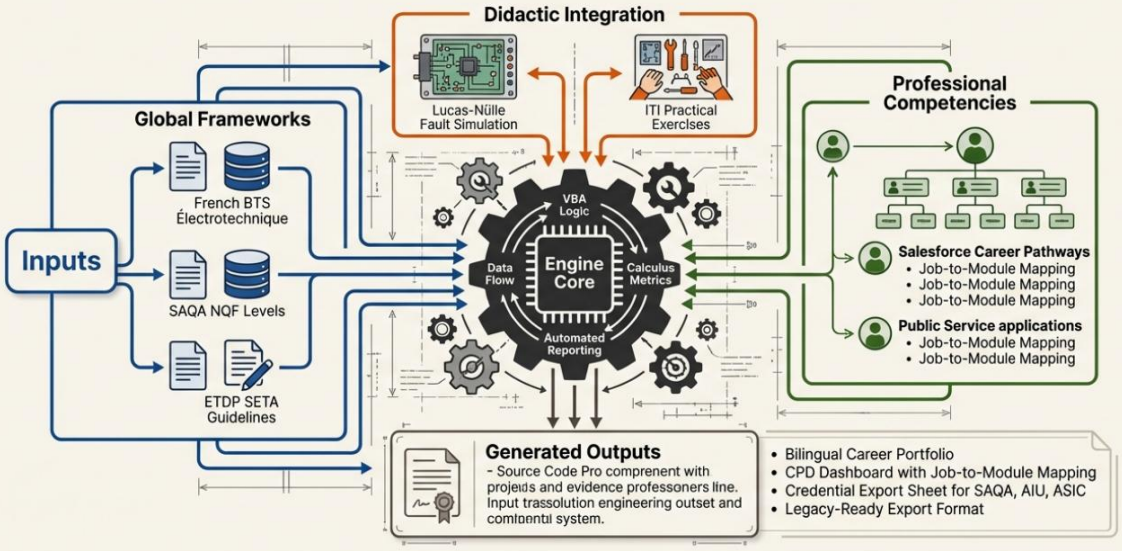
Visualizing the Workflow: An Automated, End-to-End Process



This automated workflow ensures every credential is the product of a traceable, data-driven, and verifiable process.

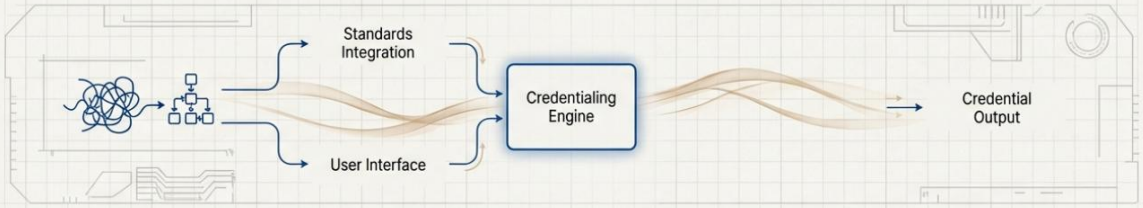
NotebookLM

The Complete Blueprint: A Synthesized Career Dashboard



NotebookLM

The Result: A Dynamic, Verifiable, and Audit-Grade Professional Identity



Systematic Architecture
Turns the chaos of modern credentialing into an ordered, logical, and automated system.

Audit-Grade Traceability
Every skill, competency, and credential is backed by a verifiable data record.

Cross-Domain Mastery
Proven ability to quantify and validate expertise in engineering, law, education, and technology.

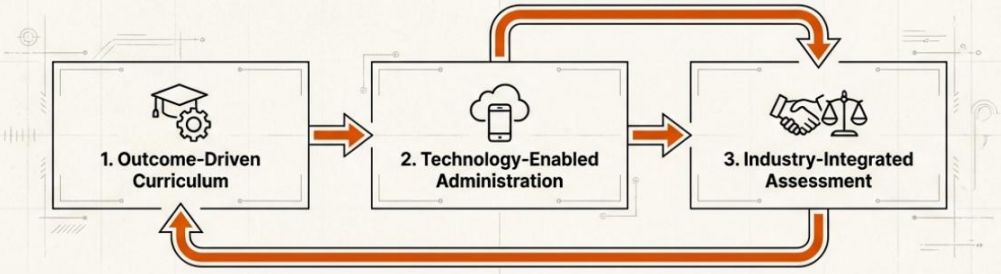
Future-Ready
An engine built for a world of continuous learning, micro-credentialing, and dynamic career paths.

This is the definitive engine for building and managing a modern professional identity—one that is intelligent, integrated, and irrefutable.

NotebookLM

The Blueprint: An Integrated Framework for TVET Engineering Studies

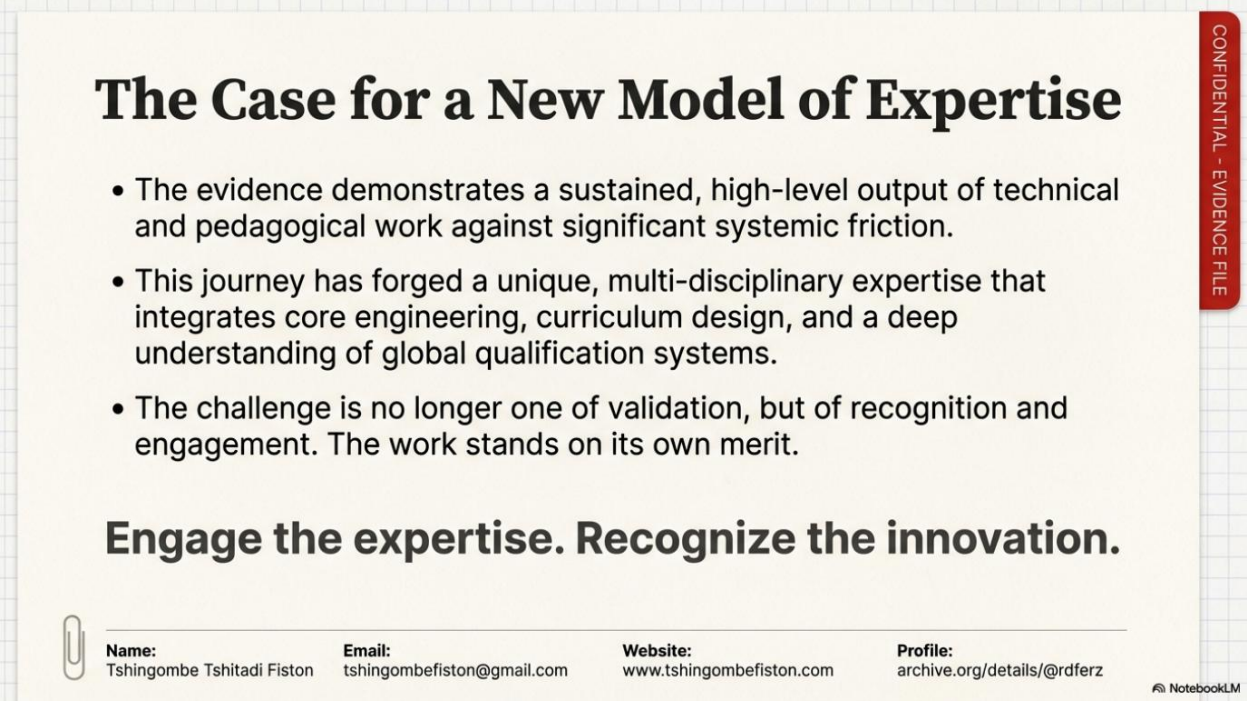
Vision: To create a responsive, technology-enabled TVET ecosystem that seamlessly integrates curriculum, practical experience, and industry needs to produce verifiably competent and employable engineering professionals.



Key Principles

- ✓ **Outcome-Oriented:** Success is measured by real-world competency, not just theoretical exams.
- ✓ **Industry-Validated:** Curriculum and assessments are co-designed and constantly validated by industry partners.
- ✓ **Digitally Integrated:** Leveraging technology (LMS, e-Portfolios, AI) to ensure efficiency, transparency, and data-driven improvement.
- ✓ **Holistic Development:** Combining technical skills with soft skills (communication, problem-solving) and professional ethics.

NotebookLM


CONFIDENTIAL - EVIDENCE FILE
The Case for a New Model of Expertise
• The evidence demonstrates a sustained, high-level output of technical and pedagogical work against significant systemic friction.
• This journey has forged a unique, multi-disciplinary expertise that integrates core engineering, curriculum design, and a deep understanding of global qualification systems.
• The challenge is no longer one of validation, but of recognition and engagement. The work stands on its own merit.
Engage the expertise. Recognize the innovation.
Name: Tshingombe Tshitadi Fiston
Email: tshingombefiston@gmail.com
Website: www.tshingombefiston.com
Profile: archive.org/details/@rdferz
NotebookLM

Understanding Protection Orders in South Africa: Your Legal Path to Safety

The South African legal system provides specific court orders to protect individuals from abuse and harassment. The process is designed to offer immediate, interim protection while the court considers making the order final. Understanding which type of order fits your situation is the first step.

Which Protection Order Do You Need?

Domestic Violence Protection Order (DPO)

For abuse from someone you have a domestic relationship with (e.g., family, partner, roommate).

Key Differences

Feature	Domestic Violence Order (DPO)	Harassment Order (HPO)
Relationship Required?	Yes, a domestic relationship is required.	No relationship is required.
Pattern of Abuse?	Requires a pattern of abusive actions.	A single incident can be sufficient.
Examples	Physical, sexual, financial, emotional abuse.	Unwanted messages, stalking, financial harm.

Harassment Protection Order (HPO)

For abuse from someone you are not in a domestic relationship with (e.g., a neighbor).

The 5-Step Process to Get a Protection Order

1. Apply at the Magistrate's Court

Complete the required application form (Form 2) with a detailed affidavit explaining the abuse.

2. Obtain an Interim Order

The court reviews your application and may issue a temporary order for immediate protection.

3. Serve the Order

The interim order must be officially served on the respondent by a sheriff or police officer.

4. Attend the Court Hearing

The court hears evidence to decide whether to grant a permanent, final protection order.

What if the Order is Violated?

Breaching a protection order is a criminal offense punishable by a fine or up to 5 years in prison.

NotebookLM

Author: tshingombe tshitadi

Curriculum assessment:

Career Education Didactic Report

Author: Tshingombe Tshitadi Theme: Curriculum Assessment in Trade & Engineering Education

🕮 Overview

This report examines the integration of career education materials, award certificates, diplomas, prizes, and innovative didactic systems within trade and engineering education. It emphasizes curriculum assessment, learner evaluation, and audit-ready documentation.

📚 Scope

- Trade and engineering education at advanced levels
- Credentialing systems: certificates, diplomas, prizes
- Didactic materials: quizzes, evaluation rubrics, learner dashboards
- Innovation and invention recognition in wholesaler and technical contexts

📝 Abstract

Career education thrives when didactic rigor, credentialing, and innovation are combined. This report explores curriculum assessment frameworks, management systems, and audit principles to ensure transparent learner recognition and sustainable educational reform.

🎯 Purpose

- To evaluate career education materials and credentialing systems
- To design audit-ready certificates and diplomas
- To integrate innovation and invention into trade wholesaler education
- To establish transparent quiz and mark evaluation systems

🔑 Keywords

Career education, didactic report, award certificate, diploma, prize, innovation, invention, trade engineering, wholesaler, quiz, evaluation, curriculum assessment, audit, management system.

📄 Description

The report describes how career education materials can be structured into audit-ready frameworks, ensuring learners receive visible recognition through certificates, diplomas, and prizes. It highlights innovation in trade engineering and wholesaler systems.

⚠ Problematic

- Lack of standardized credentialing across trade education
- Limited recognition of innovation and invention in curricula
- Inconsistent evaluation methods and mark allocation
- Weak audit systems for compliance and transparency

📝 Statement Report

This report asserts that career education must integrate didactic rigor, credentialing, and innovation recognition to empower learners and align with regulatory frameworks.

🖥 Management System Information

- Learner dashboards for progress tracking
- Digital credentialing systems (badges, certificates, transcripts)
- Audit-ready documentation aligned with councils and authorities

🔍 Principle Investigation

- Alignment of curriculum with regulatory standards
- Evaluation of innovation in trade wholesaler education
- Transparency in quiz and mark evaluation systems

Method Research

- Comparative analysis of credentialing frameworks
- Case studies of trade engineering education
- Surveys of learner and educator experiences
- Audit of management systems for compliance

✅ Advantages

- Transparent credentialing and recognition
- Motivation through prizes and innovation awards
- Audit-ready documentation for compliance
- Learner empowerment via gamified dashboards

❌ Disadvantages

- High administrative burden for audit systems
- Risk of over-standardization limiting creativity
- Resource-intensive management systems

🗄️ Management System Information (Expanded)

- Integration of LMS with credentialing dashboards
- Automated quiz banks and evaluation rubrics
- Secure audit trails for certificates and diplomas

📊 Conclusion

Career education in trade and engineering requires a balance of didactic rigor, credentialing, and innovation recognition. Audit-ready systems ensure transparency, while prizes and certificates motivate learners to achieve and invent.

💼 Audit

- Verification of certificate and diploma authenticity
- Compliance with national and international councils
- Continuous monitoring of learner progress and evaluation systems

📚 Bibliographic (Sample References)

- Council on Higher Education (CHE) guidelines
- Engineering Council of South Africa (ECSA) standards
- UNESCO TVET frameworks
- International Journal of Technical Education & Training

This structure gives you a **complete academic-style report** that can be adapted into curriculum assessment documentation, certificate design, or audit frameworks.

Would you like me to **expand this into a polished certificate/diploma template** (with placeholders for learner details, marks, and achievements), or into a **sample quiz bank with evaluation rubrics** to demonstrate the assessment system? Both would make this report more tangible.

Career Education Didactic Report

Author: Tshingombe Tshitadi Focus: Curriculum Assessment, Credentialing, and Innovation in Trade & Engineering Education

🎓 Introduction

- **Purpose**: To evaluate career education pathways in engineering and trade wholesaling.
- **Scope**: Didactic materials, award certificates, diplomas, and innovative credentialing systems.
- **Audience**: Educators, regulators, learners, and trade professionals.

📘 Career Education Material

- **Curriculum frameworks**: Structured modules aligned with regulatory standards.
- **Didactic tools**: Manuals, digital dashboards, and gamified learning aids.
- **Assessment artifacts**: Exam banks, mark evaluation rubrics, and learner progress trackers.

🎖 Award Certificates & Diplomas

- **Certificates**: Audit-ready recognition of short courses and trade skills.
- **Diplomas**: Advanced qualifications in engineering and wholesaling.
- **Prizes & innovation awards**: Incentives for invention, creativity, and applied trade solutions.

⚙ Innovation & Invention in Trade Engineering

- **Applied projects**: Learners design trade solutions with engineering principles.
- **Wholesaler focus**: Advanced logistics, compliance, and technical distribution.
- **Recognition**: Badges, medals, and certificates linked to innovation outcomes.

📊 Quiz, Marking & Evaluation

- **Quiz banks**: Modular, randomized question sets for fair assessment.
- **Mark evaluation**: Weighted rubrics ensuring transparency and compliance.
- **Feedback loops**: Learner dashboards showing achievement, gaps, and progression.

📄 Curriculum Assessment

- **Alignment**: Mapping outcomes to national and international standards.
- **Moderation**: Ensuring fairness, inclusivity, and audit readiness.
- **Continuous improvement**: Iterative updates to reflect trade and engineering innovations.

🌍 Conclusion

Career education in trade and engineering thrives when **didactic rigor**, **credentialing systems**, and **innovation recognition** are integrated. Certificates, diplomas, and prizes not only validate achievement but also inspire learners to invent, innovate, and contribute to global wholesaling and engineering systems.

This structure gives you a **report-style document** that can double as curriculum assessment material and a foundation for award certificate/diploma design.

Would you like me to expand this into a **sample award certificate layout** (with placeholders for learner names, marks, and achievements), or into a **quiz bank** that demonstrates the evaluation framework? Both would make your curriculum assessment more tangible.

☞ Do you prefer me to build out sample certificate and diploma templates or quiz and evaluation examples?

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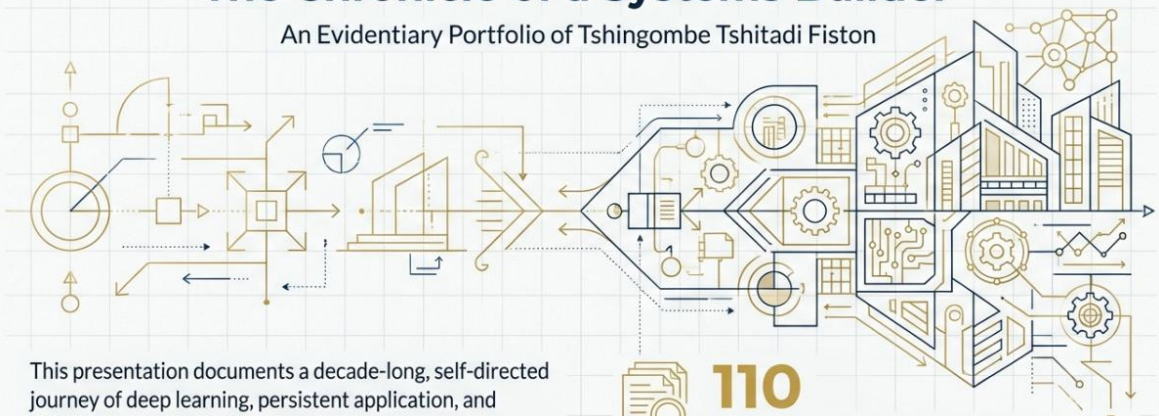
From Foundation to Framework: The Chronicle of a Systems Builder

An Evidentiary Portfolio of Tshingombe Tshitadi Fiston



This presentation documents a decade-long, self-directed journey of deep learning, persistent application, and intellectual synthesis. It makes the case for a unique and valuable innovator whose work integrates advanced engineering, educational design, and systems technology.

110

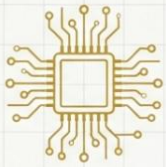
Based on a documented portfolio of over 110 pages of experimental work, research, and curriculum design.

NotebookLM

Mastery Has Been Forged Across Three Interconnected Domains

Experimental Engineering

Deep practical and theoretical knowledge in electrical systems, from fundamental principles to industrial applications.



Systems Technology

Comprehensive capability in computer science, software development, and modern data architecture.

Educational Frameworks

Expertise in curriculum design, pedagogical methods, and the architecture of technical and vocational education systems.

The following sections provide a detailed, evidence-based overview of the capabilities established within each domain.

NotebookL

Engineering Prowess Is Demonstrated Through Extensive Hands-On Experimentation

A comprehensive portfolio of practical experiments validates deep competency in core electrical engineering principles, from semiconductor physics to industrial power systems.

Fundamental Electrical & Electronic Principles

Semiconductor Band Gap: Measuring energy gap in materials.
Magnetic Induction: Voltage generation in conductor loops.
Thermodynamic Cycle: Heat pump analysis using Mollier diagrams.
Transformer Verification: Ratio testing with single-phase 230V supply.
Digital Logic Gates: Implementation and verification of AND/OR gates using switches, lamps, and ICs (e.g., IC 7408).

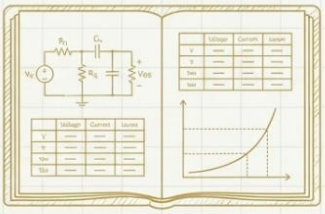
Industrial Power & Control Systems

DC/DC Power Electronics: Setup diagrams, results tables, component analysis.
Generator Protection & Fault Analysis: Application of Eaton design guides for switchgear and UPS.

Smart Grid & Network Integration

Smart Grid Performance: Investigating the role of Cisco hardware in optimizing energy distribution.
Renewable Energy Integration: Configuring Cisco hardware for monitoring and control of solar panel systems.

Visual Evidence Callout



Experiments documented with **setup diagrams**, **component analysis**, and **results tables**.

NotebookLM

Modern Technical Challenges Are Addressed with a Foundation in Computer Science and Enterprise Platforms

Proficiency spans from theoretical computer science and mathematics to the practical application of enterprise-level software for automation, data management, and system design.

Foundational Concepts

Mathematical Proofs: Axiomatic, contradiction, induction.

Logic & Cryptography: Predicate calculus, modular arithmetic, RSA encryption.

Network & Data Structures: Graph theory, network routing, adjacency matrices.

Probability & State Machines: CPU verification errors, recursive definitions, halting problem.

Applied Platforms & Tools

Automation & Scripting: Microsoft Excel + VBA + MSForms for multi-form interfaces (student records, PLC simulation).

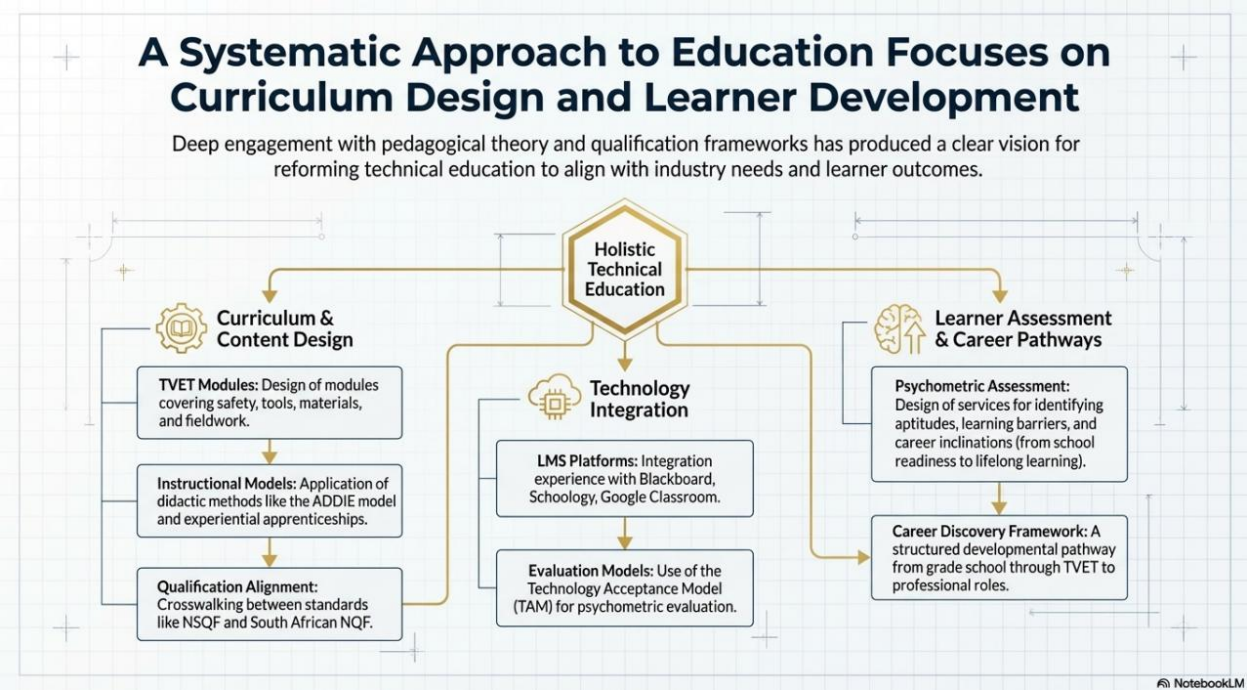
Cloud & DevOps: Azure DevOps, Microsoft Fabric for data warehousing, Microsoft Purview for data discovery.

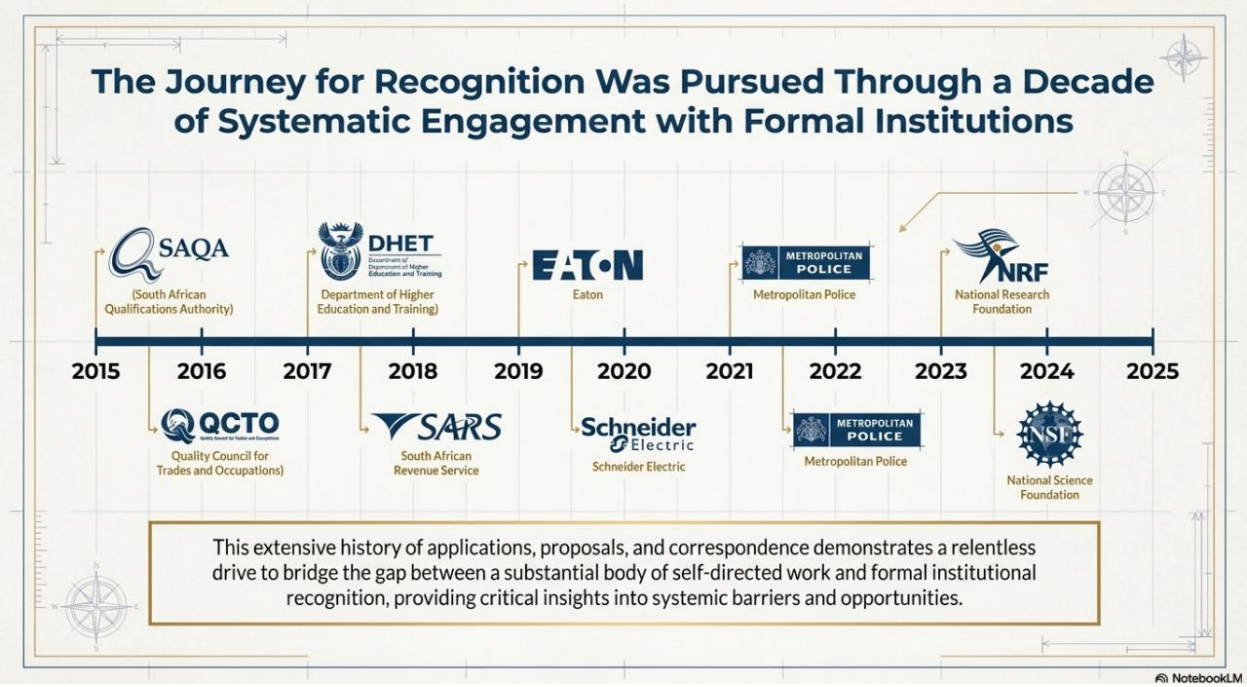
Enterprise Systems: Knowledge of Schneider Electric platforms, Cisco networking hardware.

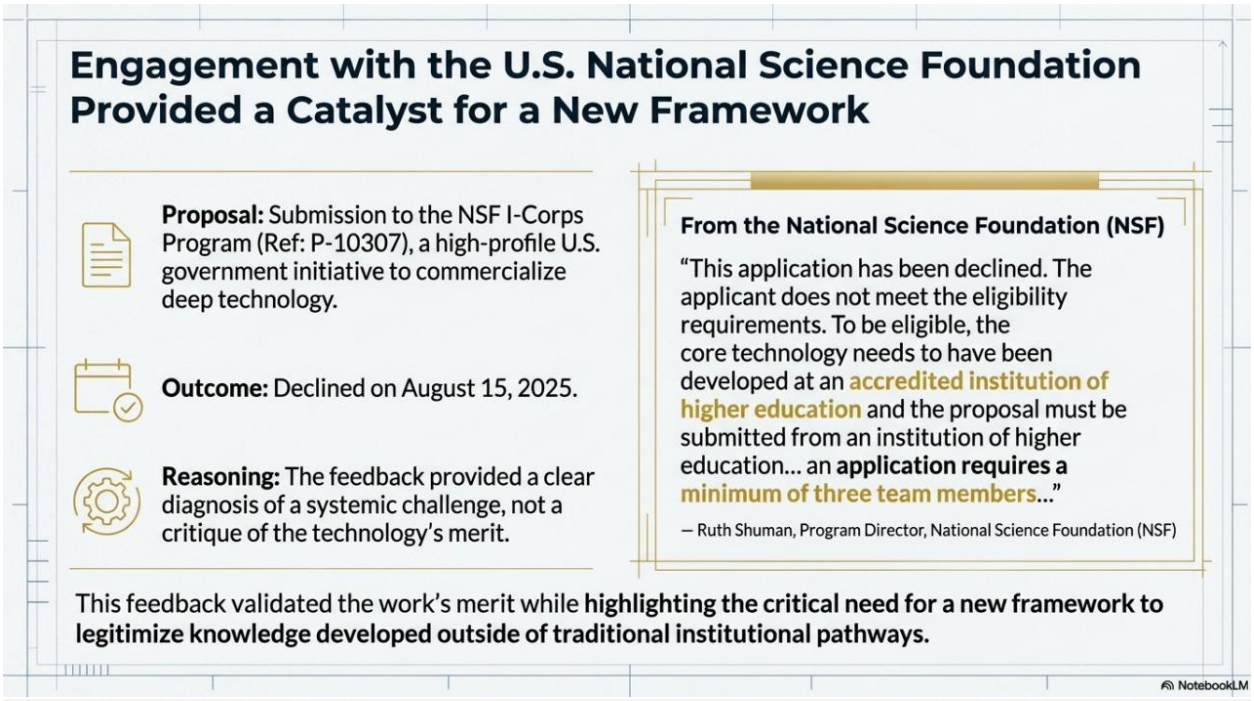
AI & Machine Learning: Conceptual knowledge of pattern recognition, knowledge mining (Azure AI Search), and data analytics.

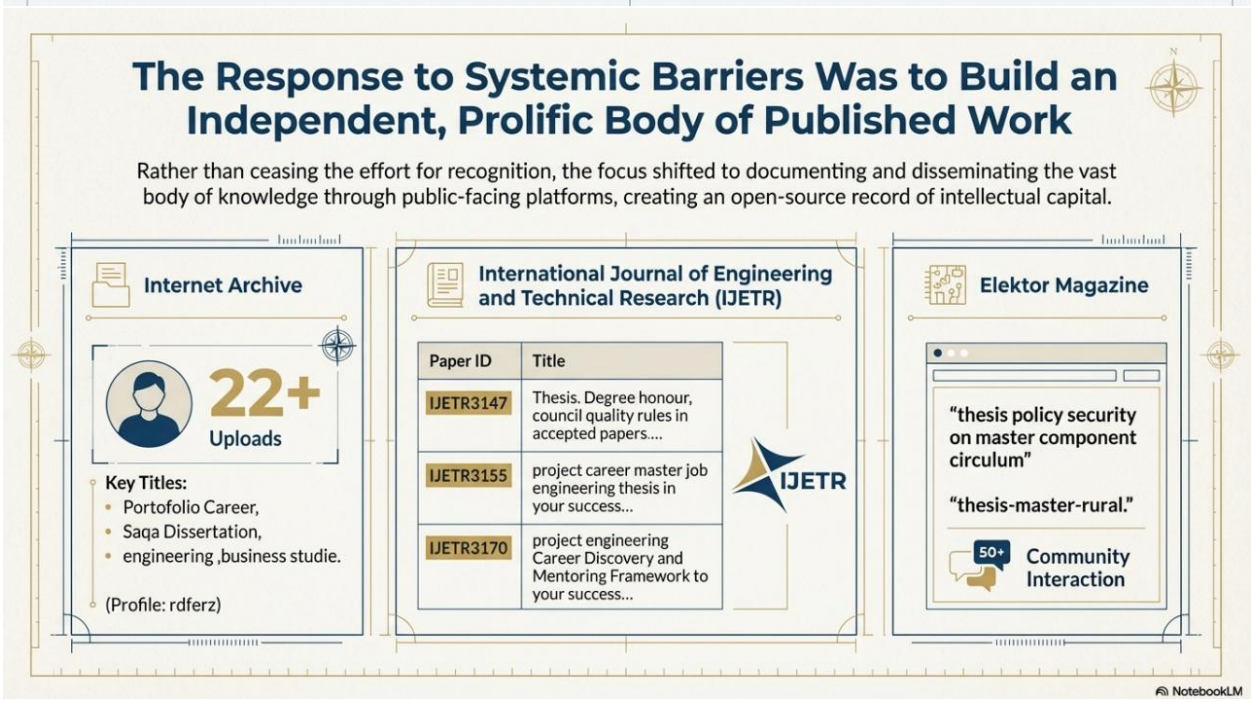
Microsoft
Schneider Electric
CISCO

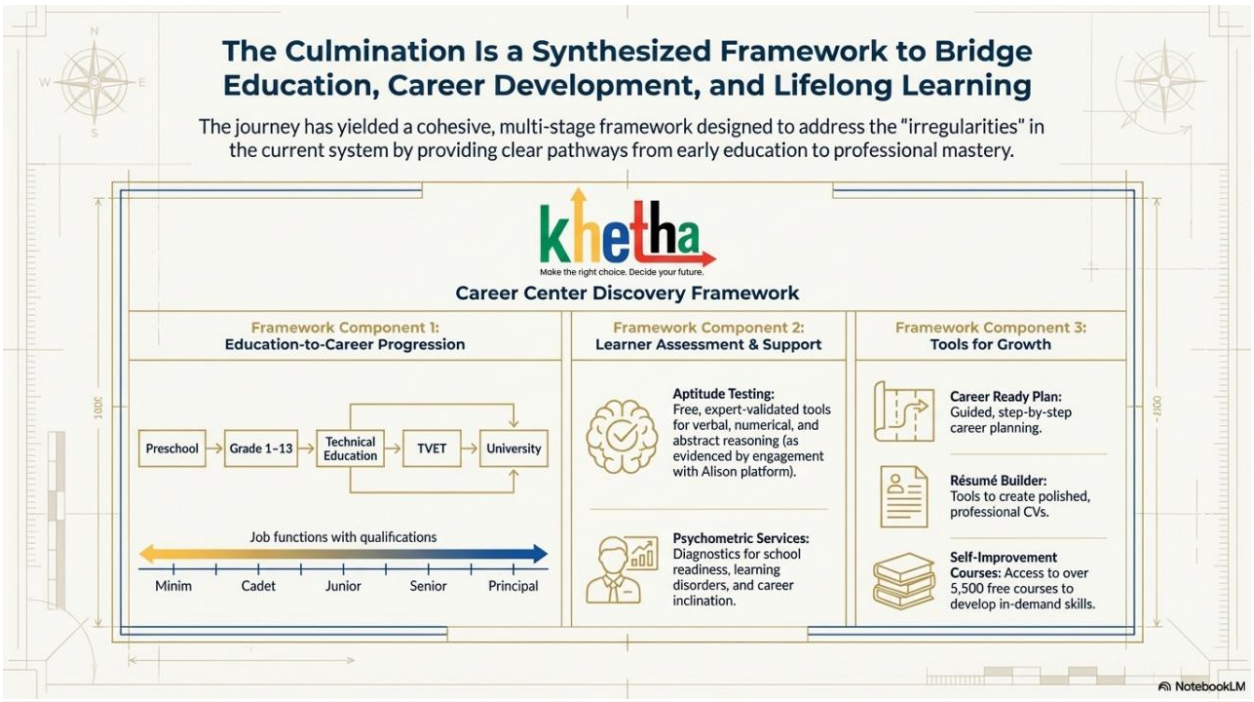
NotebookLM

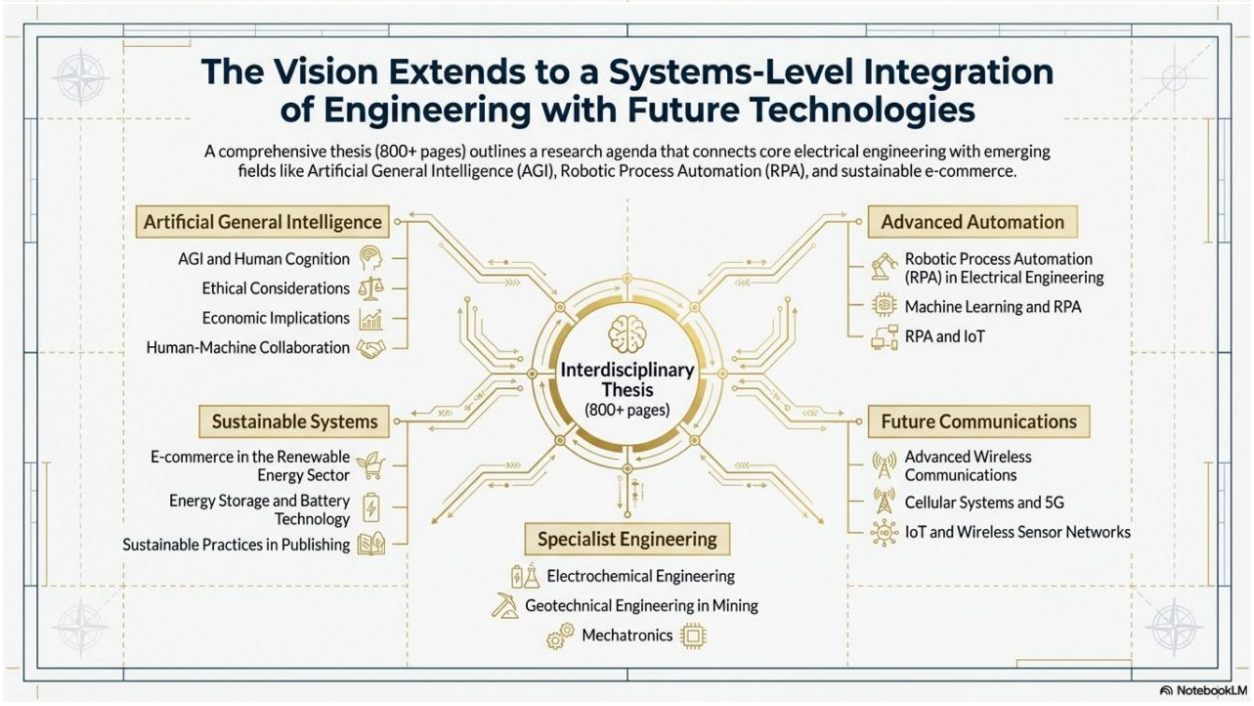

A Systematic Approach to Education Focuses on Curriculum Design and Learner Development
Deep engagement with pedagogical theory and qualification frameworks has produced a clear vision for reforming technical education to align with industry needs and learner outcomes.
Holistic Technical Education
Curriculum & Content Design
TVET Modules: Design of modules covering safety, tools, materials, and fieldwork.
Instructional Models: Application of didactic methods like the ADDIE model and experiential apprenticeships.
Qualification Alignment: Crosswalking between standards like NSQF and South African NQF.
Technology Integration
LMS Platforms: Integration experience with Blackboard, Schoology, Google Classroom.
Evaluation Models: Use of the Technology Acceptance Model (TAM) for psychometric evaluation.
Learner Assessment & Career Pathways
Psychometric Assessment: Design of services for identifying aptitudes, learning barriers, and career inclinations (from school readiness to lifelong learning).
Career Discovery Framework: A structured developmental pathway from grade school through TVET to professional roles.
NotebookLM

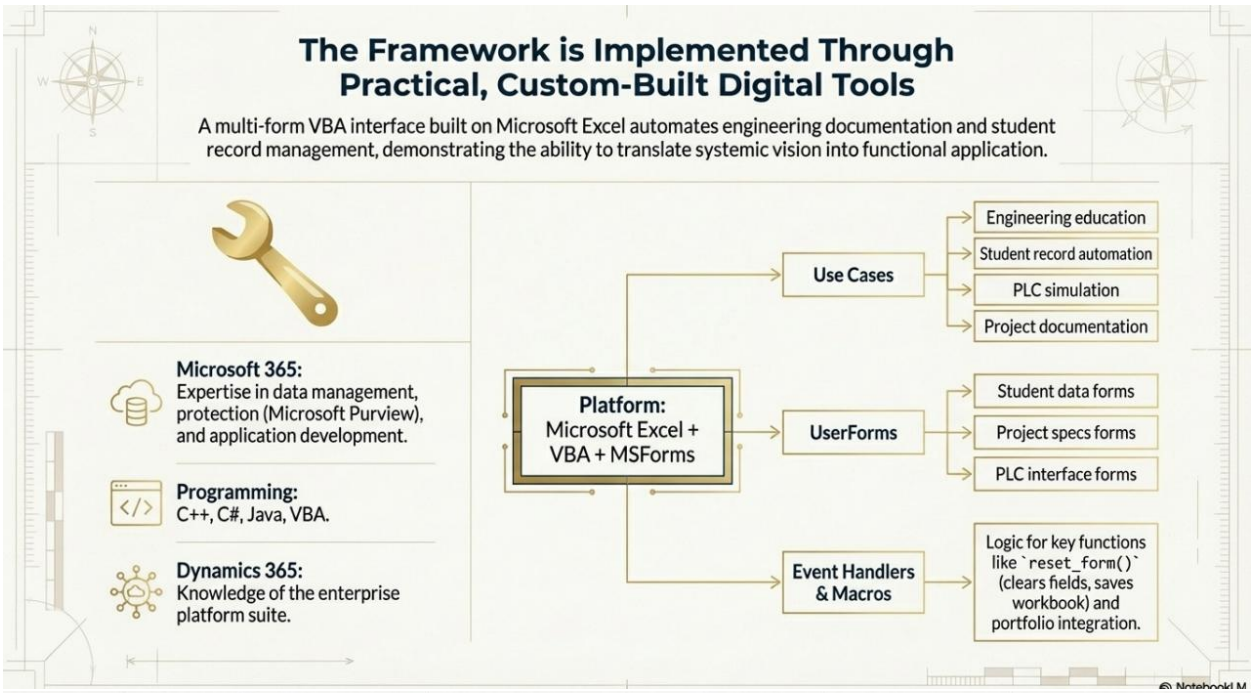

The Journey for Recognition Was Pursued Through a Decade of Systematic Engagement with Formal Institutions
SAQA
(South African Qualifications Authority)
DHET
Department of Higher Education and Training)
EATON
Eaton
METROPOLITAN POLICE
Metropolitan Police
NRF
National Research Foundation
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
QCTO
Quality Council for Trades and Occupations)
SARS
South African Revenue Service
Schneider Electric
Schneider Electric
METROPOLITAN POLICE
Metropolitan Police
NSF
National Science Foundation
This extensive history of applications, proposals, and correspondence demonstrates a relentless drive to bridge the gap between a substantial body of self-directed work and formal institutional recognition, providing critical insights into systemic barriers and opportunities.
NotebookLM


Engagement with the U.S. National Science Foundation Provided a Catalyst for a New Framework
Proposal: Submission to the NSF I-Corps Program (Ref: P-10307), a high-profile U.S. government initiative to commercialize deep technology.
Outcome: Declined on August 15, 2025.
Reasoning: The feedback provided a clear diagnosis of a systemic challenge, not a critique of the technology's merit.
From the National Science Foundation (NSF)
"This application has been declined. The applicant does not meet the eligibility requirements. To be eligible, the core technology needs to have been developed at an accredited institution of higher education and the proposal must be submitted from an institution of higher education... an application requires a minimum of three team members..."
— Ruth Shuman, Program Director, National Science Foundation (NSF)
This feedback validated the work's merit while highlighting the critical need for a new framework to legitimize knowledge developed outside of traditional institutional pathways.
NotebookLM

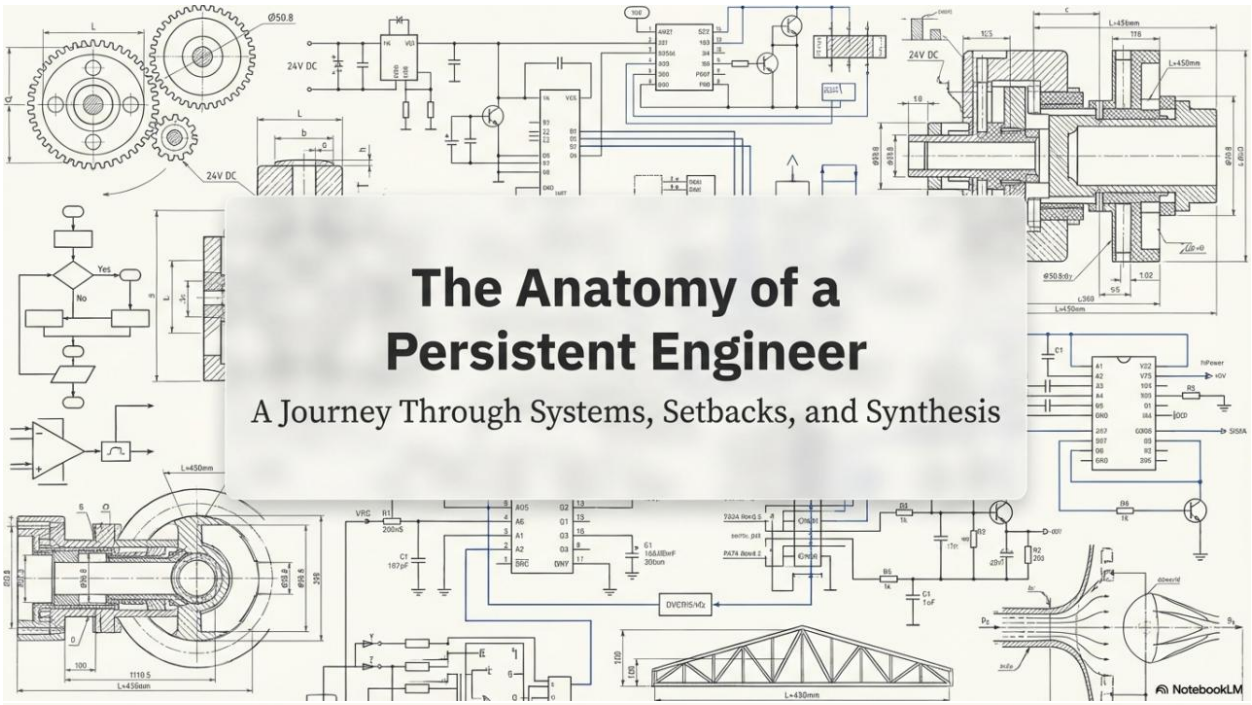

The Response to Systemic Barriers Was to Build an Independent, Prolific Body of Published Work
Rather than ceasing the effort for recognition, the focus shifted to documenting and disseminating the vast body of knowledge through public-facing platforms, creating an open-source record of intellectual capital.
Internet Archive
22+
Uploads
Key Titles:
Portofolio Career,
Saqa Dissertation,
engineering ,business studie.
(Profile: rdferz)
International Journal of Engineering and Technical Research (IJETR)
Paper ID
Title
IJETR3147
Thesis. Degree honour, council quality rules in accepted papers....
IJETR3155
project career master job engineering thesis in your success...
IJETR3170
project engineering Career Discovery and Mentoring Framework to your success...
IJETR
Elektor Magazine
"thesis policy security on master component circulum"
"thesis-master-rural."
50+
Community Interaction
NotebookLM


The Culmination Is a Synthesized Framework to Bridge Education, Career Development, and Lifelong Learning
The journey has yielded a cohesive, multi-stage framework designed to address the "irregularities" in the current system by providing clear pathways from early education to professional mastery.
khetha
Make the right choice. Decide your future.
Career Center Discovery Framework
Framework Component 1: Education-to-Career Progression
Preschool
Grade 1–13
Technical Education
TVET
University
Job functions with qualifications
Minim
Cadet
Junior
Senior
Principal
Framework Component 2: Learner Assessment & Support
Aptitude Testing: Free, expert-validated tools for verbal, numerical, and abstract reasoning (as evidenced by engagement with Alison platform).
Psychometric Services: Diagnostics for school readiness, learning disorders, and career inclination.
Framework Component 3: Tools for Growth
Career Ready Plan: Guided, step-by-step career planning.
Résumé Builder: Tools to create polished, professional CVs.
Self-Improvement Courses: Access to over 5,500 free courses to develop in-demand skills.
NotebookLM


The Vision Extends to a Systems-Level Integration of Engineering with Future Technologies
A comprehensive thesis (800+ pages) outlines a research agenda that connects core electrical engineering with emerging fields like Artificial General Intelligence (AGI), Robotic Process Automation (RPA), and sustainable e-commerce.
Artificial General Intelligence
AGI and Human Cognition
Ethical Considerations
Economic Implications
Human-Machine Collaboration
Sustainable Systems
E-commerce in the Renewable Energy Sector
Energy Storage and Battery Technology
Sustainable Practices in Publishing
Interdisciplinary Thesis (800+ pages)
Advanced Automation
Robotic Process Automation (RPA) in Electrical Engineering
Machine Learning and RPA
RPA and IoT
Future Communications
Advanced Wireless Communications
Cellular Systems and 5G
IoT and Wireless Sensor Networks
Specialist Engineering
Electrochemical Engineering
Geotechnical Engineering in Mining
Mechatronics
NotebookLM


The Framework is Implemented Through Practical, Custom-Built Digital Tools
A multi-form VBA interface built on Microsoft Excel automates engineering documentation and student record management, demonstrating the ability to translate systemic vision into functional application.
Microsoft 365:
Expertise in data management, protection (Microsoft Purview), and application development.
Programming:
C++, C#, Java, VBA.
Dynamics 365:
Knowledge of the enterprise platform suite.
Platform:
Microsoft Excel + VBA + MSForms
Use Cases
Engineering education
Student record automation
PLC simulation
Project documentation
UserForms
Student data forms
Project specs forms
PLC interface forms
Event Handlers & Macros
Logic for key functions like `reset_form()` (clears fields, saves workbook) and portfolio integration.

The Result Is a Unique Innovator Who Has Synthesized Theory, Practice, and Systemic Insight
Proven Resilience and Ambition
A decade of persistent, documented effort to engage with and improve established systems, turning rejection into a catalyst for innovation.
A Rare Interdisciplinary Skillset
The demonstrated ability to operate at the intersection of hands-on electrical engineering, modern software development, and strategic educational design.
A Systems Builder with a Legitimizing Framework
The final output is not just a collection of skills, but a coherent, evidence-backed framework that offers a solution to the challenge of recognizing and integrating non-traditional expertise.
This body of work represents a fully-formed, unique intellectual asset ready for high-level application in industry, academia, or national qualifications development.



The Spark of Inquiry: A Foundation of Continuous Learning

A member of the Elektor international community, a source of essential electronic engineering information and innovative solutions for engineers and pro makers.

– **Name:** fiston tshingombe
– **Country:** South Africa

Engaging with a diverse range of publications, from *TopGear* and *Motor Trader Magazine* to *Magnum Magazine*.

Hi there, a warm welcome from our Elektor community!

For your records, below is a copy of the information you submitted to us.

- **Email:** tshingombefiston@gmail.com
- **First Name:** fiston
- **Last Name:** tshingombe
- **Country:** South Africa

elektor
TopGear
Motor Trader

'Keep on being curious and open to new challenges! #LearnEveryDay'

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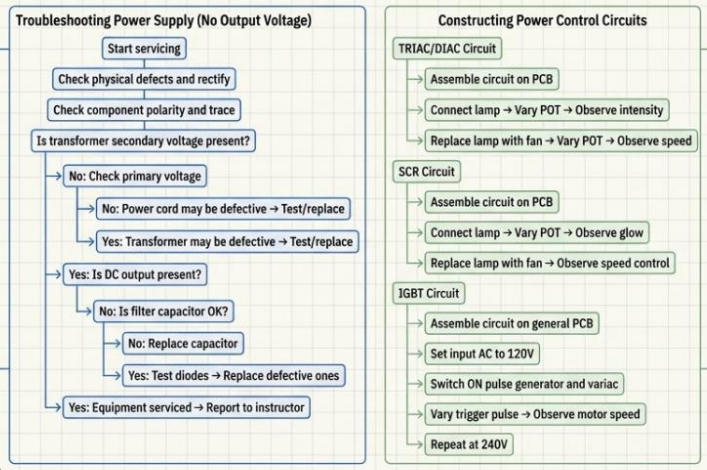
Troubleshooting Power Supplies
Systematic diagnosis of 'No Output Voltage' scenarios, from checking physical defects to testing diodes and capacitors.

Forging the Tools: Mastering Foundational Electrotechnology

Constructing Power Control Circuits
Practical assembly and testing of TRIAC/DIAC, SCR, and IGBT circuits for controlling loads like lamps and fans.


Troubleshooting Power Supply (No Output Voltage)
Start servicing
Check physical defects and rectify
Check component polarity and trace
Is transformer secondary voltage present?
No: Check primary voltage
No: Power cord may be defective → Test/replace
Yes: Transformer may be defective → Test/replace
Yes: Is DC output present?
No: Is filter capacitor OK?
No: Replace capacitor
Yes: Test diodes → Replace defective ones
Yes: Equipment serviced → Report to instructor
Constructing Power Control Circuits
TRIAC/DIAC Circuit
Assemble circuit on PCB
Connect lamp → Vary POT → Observe intensity
Replace lamp with fan → Vary POT → Observe speed
SCR Circuit
Assemble circuit on PCB
Connect lamp → Vary POT → Observe glow
Replace lamp with fan → Observe speed control
IGBT Circuit
Assemble circuit on general PCB
Set input AC to 120V
Switch ON pulse generator and variac
Vary trigger pulse → Observe motor speed
Repeat at 240V

Transistor as an Electronic Switch
Determining minimum base current (Ib) for saturation and verifying ON/OFF action with a lamp load.

PCB Fabrication
From schematic to physical board—etching, drilling, and inspection.

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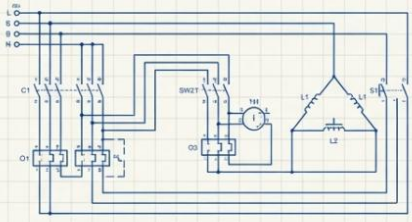
From Theory to Application: Advanced Control Systems and Automation

Industrial Control Panel Wiring

Objective: Assembling and testing an Automatic Star-Delta Starter for an induction motor with forward/reverse control.

- Layout design
- DIN rail and raceway assembly
- Wiring of control and power circuits
- Insulation resistance testing
- Overload relay settings



Practical Programming & Logging

```
' Module: TransistorSwitchRegulator
' Purpose: Log transistor switch/regulator measurements
Option Explicit

Private Type SwitchRecord
    Ib_uA As Double
    Ic_mA As Double
    State As String
End Type

...

Public Sub LogSwitch(ByVal idx As Integer, ByVal Ib As
    Double, ByVal Ic As Double, ByVal State As String)
  ...
  Debug.Print "Switch log: Ib=" & Ib & " uA, Ic=" & Ic &
    " mA, State=" & State
End Sub
```

NotebookLM

The Mathematical Bedrock: Engineering Principles from First Principles

Differential Calculus

Applying differentiation for rates of change and optimization. Example: Quotient Rule to differentiate y = ln(x)/x.

$$\frac{dy}{dx} = \frac{\frac{1}{x} \cdot x - \ln(x) \cdot 1}{x^2} = \frac{1 - \ln(x)}{x^2}$$

Integral Calculus

Using integration for computing areas, volumes, and totals. Example: Finding the volume of a solid by rotating y = x^2 using the Disk Method.

$$V = \pi \int [f(x)]^2 \, dx = \pi \int (x^2)^2 \, dx$$

Complex Numbers

Essential for AC circuit analysis, representing impedance and phase relationships in a single expression.

$$Z = R + j(X_L - X_C)$$

Network Theorems & Signal Processing

Utilizing Laplace Transforms for analyzing linear time-invariant systems in the frequency domain.

$$\mathcal{L}\{f(t)\} = F(s) = \int_0^\infty e^{-st} f(t) dt$$

NotebookLM

The Proving Ground: A Global Pursuit of Engineering Excellence

Roles Applied For (A Sample):

- Electronics Development Engineer
- Lead Data Analyst
- Cloud Engineer
- Propulsion Systems Design Release Engineer
- HV Battery Build & Test Engineer
- Embedded Hardware Engineer
- Field Service Engineer - UPS

Key Companies:

Eskom · South African Reserve Bank · SARS South African Revenue Service · City Power · Metropolitan Police · Ford · Eaton

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A Chronicle of Applications: Documenting the Search

BCU Learning and Development Lead, Business Analyst – Strategy, Planning and Performance, Character Enquiry Centre Team Leader...

Ford Motor Company (Jan 2024)

Process Technician, Electrical Engineer, Powertrain Calibration Engineer, Software Engineer, Head of Product Marketing, Systems Integration Electrical Architecture, HV Battery Build & Test Engineer, Propulsion Systems Design Release Engineer, Embedded Hardware Engineer, Road Loads Development Engineer, Software Developer, Powertrain Systems Integration Engineer...

South African Reserve Bank (SARB) (Aug-Sep 2024)

Bank Analyst, Lead Policy Analyst, Business Analysis Competency Centre Lead, Cloud Engineer, SHEQ Analyst...

Eskom (Sep 2024)

Learning Programme Engineer in Training (Megawatt Park), Learning Programme Engineer in Training (Matla Power Station), Manager Site Outage Execution (Tutuka Power Station), Senior Supervisor Technical Projects, Snr-Advisor-Applications-Support (Group IT), Officer Security (Bellville), Officer catering...

Metropolitan Police Service (Sep 2024)

Electronics Development Engineer, Junior Data Engineer, Business Change Manager, Dev Ops Engineer, Higher Computer Aided Surveyor, Lead Data Analyst, HOLMES Typist, Intelligence Manager, MBS Reporting Senior Analyst, MetCC Centre Facilities Support Staff, BCU Learning and Development Lead, Business Analyst – Strategy, Planning and Performance, Character Enquiry Centre Team Leader...

Metropolitan Police Service (Sep 2024)

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The Paradox of the Gatekeepers

The Rejection

Vacancy: 17879 - Electronics Development Engineer

M Met Recruitment Team
To:

Dear tshingombe,

Thank you for your application for a new position within the Met. ... Based on the information you have shared so far; we regret to inform you that you are not eligible to progress with your application. Your individual answers suggest that you do not meet the application criteria.

The Evidence of Expertise

```
' Module: TransistorTest
' Purpose: Identify transistor type and log test results
Private Type TransistorRecord
    LabelNo As String
    TypeNo As String
    Semiconductor As String
    Polarity As String
    PackageType As String
    BasePin As String
    EmitterPin As String
    CollectorPin As String
    EB_ForwardRes As String
    BC_ReverseRes As String
End Type
```

Demonstrated proficiency in creating automated test and logging procedures for electronic components.

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Expanding the Aperture: From Circuits to Social Systems

Legal & Ethical Frameworks

Participation in the “Removing Barriers to Officer Accountability” webinar with the Policing Project at NYU School of Law, earning NY CLE Credit.

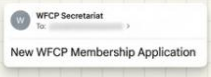
Policy & Governance

Submitting information requests and incident reports to the Metropolitan Police Service, engaging directly with civic processes.

Ref: FOI-22728-24-0100-000
Ref: MIP-482-24-0100-000

Global Education Networks

Applying for institutional membership with the World Federation of Colleges and Polytechnics (WFCP).



Psychometrics & Data

Engaging with psychometric screeners and values questionnaires from SARS and the National Career Advice Portal (NCAP), linking personality and skills to professional roles.

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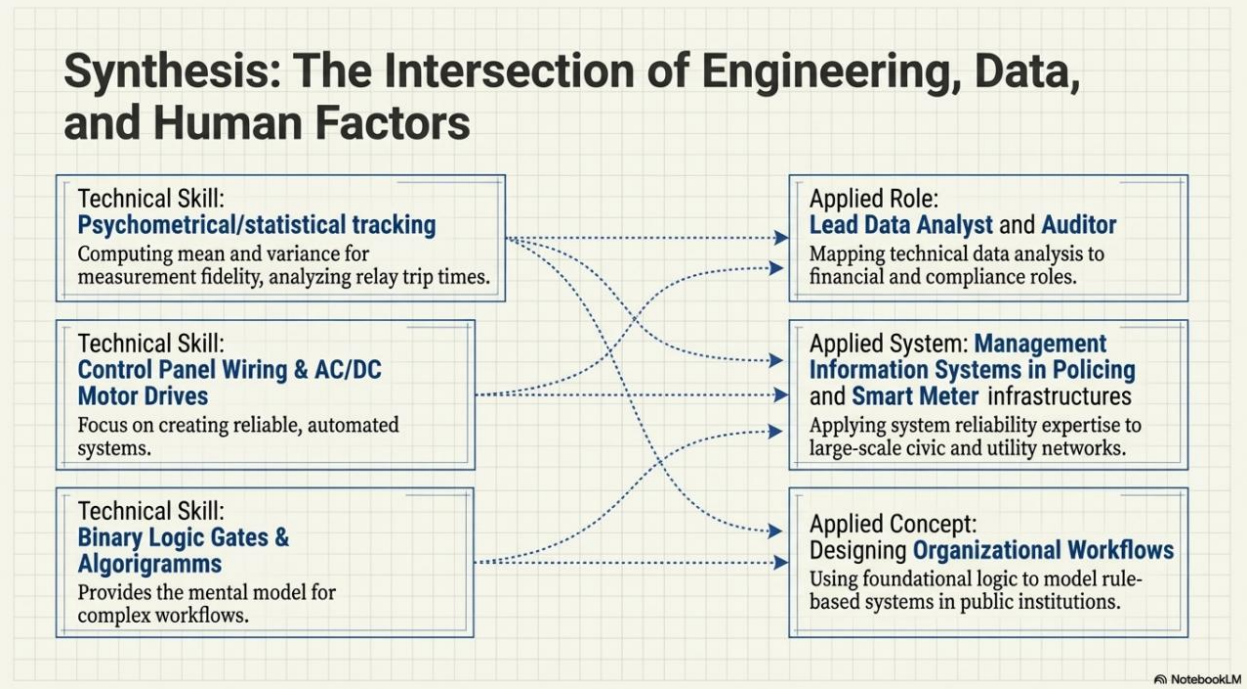
Synthesis: The Intersection of Engineering, Data, and Human Factors
Technical Skill:
Psychometrical/statistical tracking
Computing mean and variance for measurement fidelity, analyzing relay trip times.
Technical Skill:
Control Panel Wiring & AC/DC Motor Drives
Focus on creating reliable, automated systems.
Technical Skill:
Binary Logic Gates & Algorigramms
Provides the mental model for complex workflows.
Applied Role:
Lead Data Analyst and Auditor
Mapping technical data analysis to financial and compliance roles.
Applied System: Management Information Systems in Policing and Smart Meter infrastructures
Applying system reliability expertise to large-scale civic and utility networks.
Applied Concept:
Designing Organizational Workflows
Using foundational logic to model rule-based systems in public institutions.
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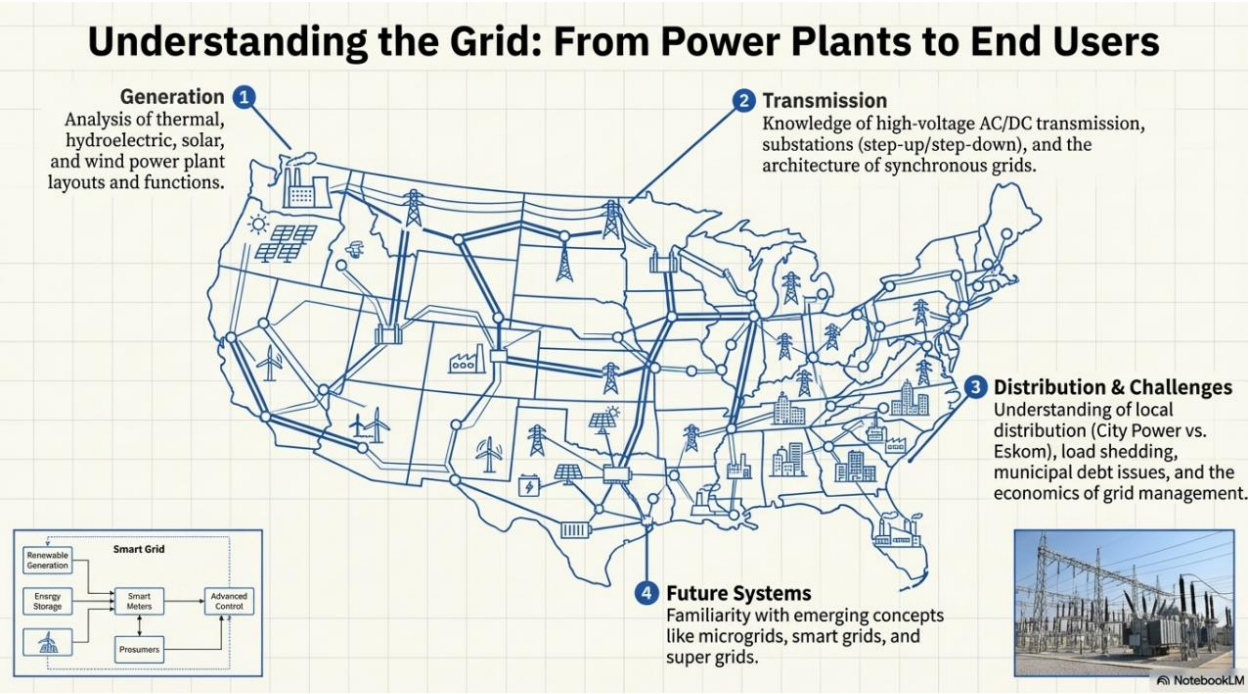
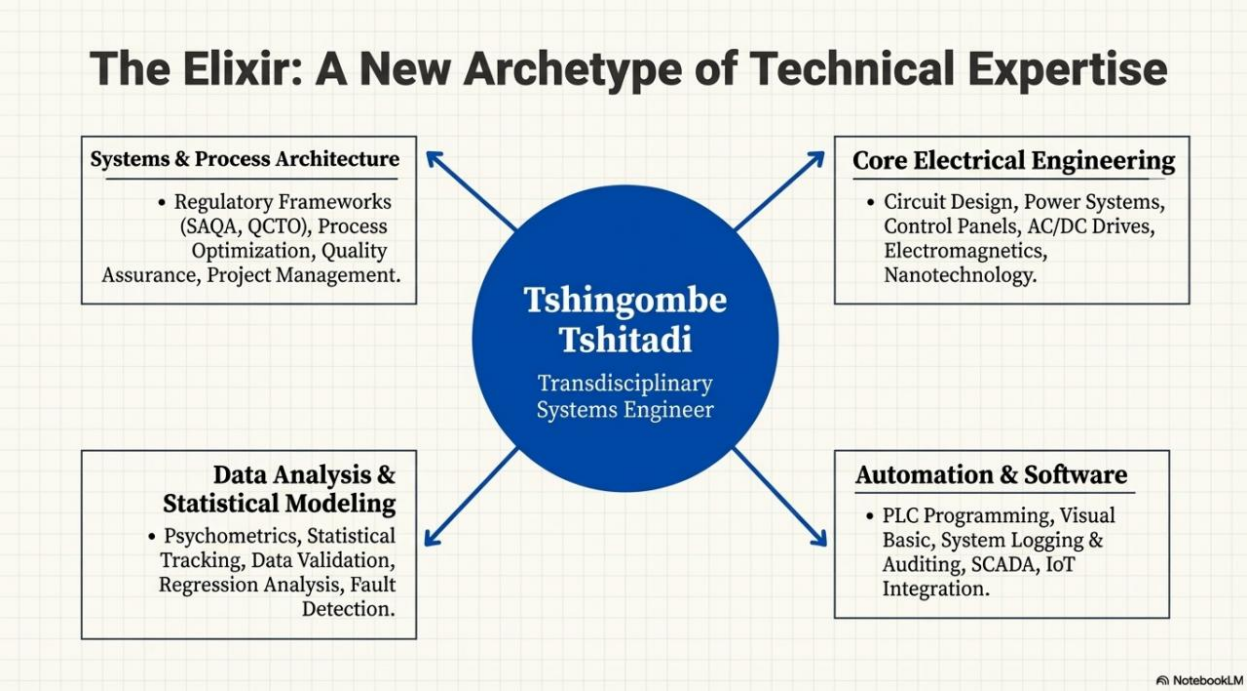

Understanding the Grid: From Power Plants to End Users
1 Generation
Analysis of thermal, hydroelectric, solar, and wind power plant layouts and functions.
2 Transmission
Knowledge of high-voltage AC/DC transmission, substations (step-up/step-down), and the architecture of synchronous grids.
3 Distribution & Challenges
Understanding of local distribution (City Power vs. Eskom), load shedding, municipal debt issues, and the economics of grid management.
4 Future Systems
Familiarity with emerging concepts like microgrids, smart grids, and super grids.
Smart Grid
Renewable Generation
Energy Storage
Smart Meters
Advanced Control
Prosumers
NotebookLM


The Elixir: A New Archetype of Technical Expertise
Systems & Process Architecture
• Regulatory Frameworks (SAQA, QCTO), Process Optimization, Quality Assurance, Project Management.
Core Electrical Engineering
• Circuit Design, Power Systems, Control Panels, AC/DC Drives, Electromagnetics, Nanotechnology.
Tshingombe Tshitadi
Transdisciplinary Systems Engineer
Data Analysis & Statistical Modeling
• Psychometrics, Statistical Tracking, Data Validation, Regression Analysis, Fault Detection.
Automation & Software
• PLC Programming, Visual Basic, System Logging & Auditing, SCADA, IoT Integration.
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Ready to Engineer the Future

A professional who not only designs and builds technical systems but also understands the data they generate, the human processes they support, and the strategic objectives they serve. The journey has forged a unique ability to bridge the gap between pure engineering and effective, data-driven implementation.

Design:
From PCBs to power grids.

Analyze:
From circuit faults to statistical trends.

Automate:
From component testing to workflow logging.

Synthesize:
From technical data to strategic insight.

Name:
Tshingombe Tshitadi

Email:
tshingombefiston@gmail.com / tshingombekb@gmail.com

Website:
https://tshingombefiston.com

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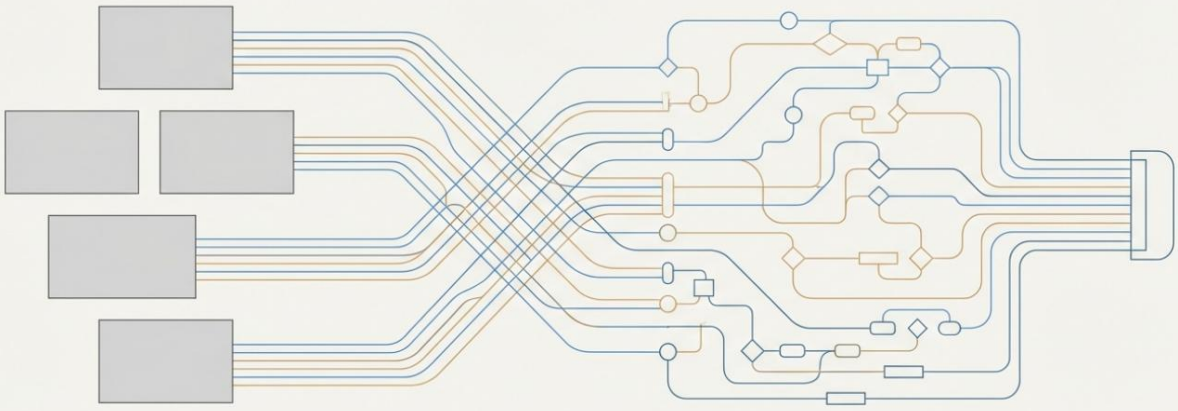
From Fragmentation to Integration: A New Framework for 21st-Century Expertise

How “Logigrammes” Create an Auditable Map of Cross-Disciplinary Competency



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The Credentialing Paradox: When Expertise Falls Through the Cracks

In May 2025, a submission titled “thesis master engineering Thesis master doctoral engineering electrical subject ciriculum framework qualicafition Education technology” was submitted to the ISC2 Security Congress.

It represented a deep, interdisciplinary synthesis of technical engineering, cybersecurity principles, and educational framework design.

Despite its depth, it was rejected. Why? With over 600 proposals for 80 available speaking slots, the system prioritizes submissions that fit neatly into predefined categories. Multi-domain expertise often fails to meet this narrow criteria.

From: Bradley Barth, Global Event Program Manager, ISC2

...we are unable to accept your submission, **“thesis master engineering Thesis master doctoral engineering electrical subject ciriculum framework qualicafition Education technology,”** at this time. We received more than 600 proposals this year for 80 available speaking slots, so there were many quality submissions that did not get selected.

The Silos of Modern Skills: Engineering, Security, Law, and Education

Professional development and credentialing systems treat distinct knowledge domains as separate verticals.

This model fails to recognize or reward the critical value created at their intersections.

An expert in one field is often seen as a novice in another, even when the underlying principles are deeply connected.

Industrial & Electrical Engineering

- Control Systems
- Power Distribution
- AC/DC Machines
- PLCs
- NFPA Standards

Cybersecurity & IT Systems

- Risk Management
- Access Control
- Network Architecture
- NIST Frameworks
- CISSP-ISSMP

Legal & Regulatory Compliance

- PSIRA
- SAQA
- DHET
- Labour Law
- CCMA
- Forensic Investigation

Pedagogy & Curriculum Design

- NATED/NCV
- Assessment Rubrics
- Skills for Work
- Didactic Methods
- Learnership Frameworks

NotebookLM

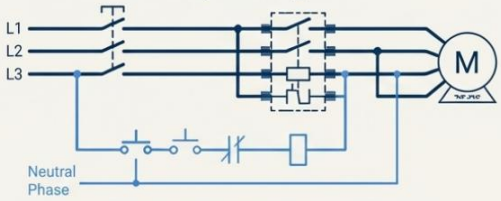
Silo 1: Deep Expertise in Industrial and Electrical Engineering

Mastery of engineering is not just theoretical. It requires hands-on knowledge of components, safety protocols, and system design, from basic circuits to complex industrial automation.

Component Knowledge

TeSys T LTMR Motor Management Controller | Modicon M171 | PowerLogic P5

System Design



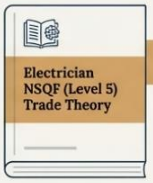
Example: Direct On Line (DOL) Starter Configuration.

Safety & Standards

Key Standards Compliance

- NFPA 70 (National Electrical Code)
- NFPA 70E (Electrical Safety in the Workplace)
- ISO Metric thread standards

Practical Skills



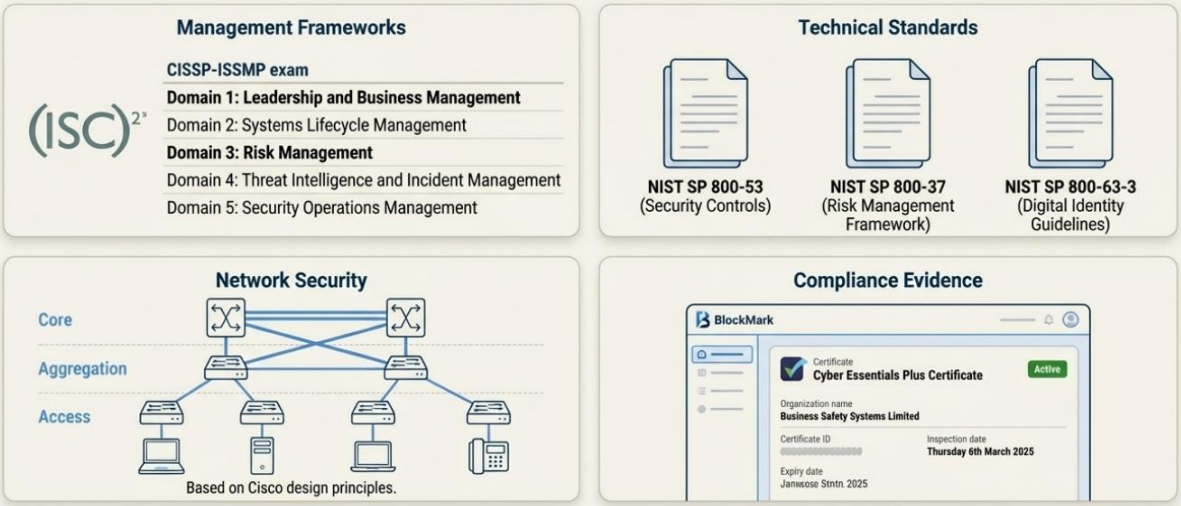
Electrician NSQF (Level 5) Trade Theory

- Determine the V-I characteristics of semiconductor diode
- Assemble and connect solar panel for illumination.

NotebookLM

Silo 2: A Foundation in Cybersecurity and Systems Architecture

Effective security is not an add-on; it's engineered into the lifecycle of a system. This requires a command of internationally recognized frameworks, risk management principles, and the technical controls that underpin them.



NotebookLM

Silo 3: Navigating Legal and Regulatory Frameworks

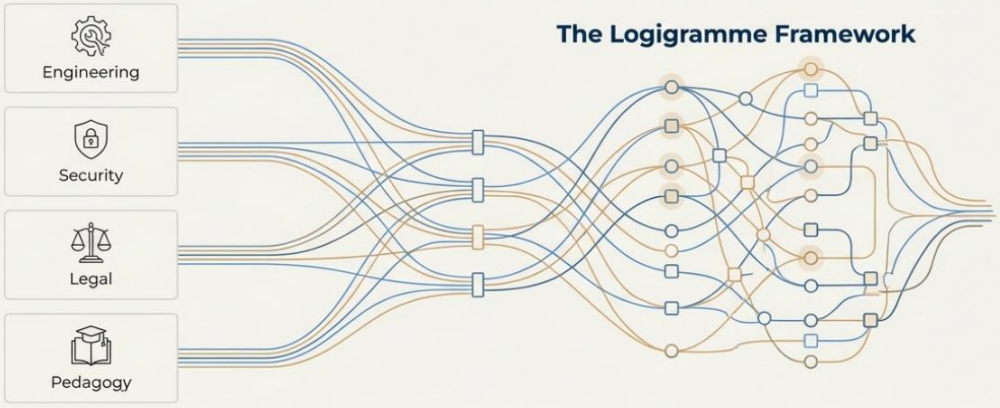
Technical solutions are only viable if they comply with legal, regulatory, and labor standards. This requires deep knowledge of public policy, security industry regulations, and the mechanisms for dispute resolution.

Private Security Industry Regulation Act 56 of 2001
"...the authority may register any applicant as a security service provider on good cause shown."
PSiRA
SAQA
higher education and training
Governing bodies for curriculum approval and qualification standards.
In the Labour Court of South Africa, Johannesburg.
Case No: JR 2461/15.
CCMA Award
Access to HE Diploma (Policing)
Learning Outcome
Demonstrate understanding of the principles of police investigation and community policing.

NotebookLM

Introducing the Logigramme: A Framework for Integrated Competency

The solution to fragmented expertise is not more specialization, but a system of integration. A “Logigramme” is a visual and algorithmic method for mapping, validating, and connecting cross-disciplinary skills. It transforms a collection of credentials, projects, and experiences into a coherent, auditable, and dynamic map of an individual’s or an organization’s true capabilities.



NotebookLM

The Logic of Integration: How a Logigramme Works

A Logigramme operates on a simple but powerful principle: every skill, credential, or task is a node in a network, defined by its inputs, processes, and outputs. By codifying these relationships, we can build a verifiable chain of competency.

Algorigramme Example

Input Record Details
Calculate Final Cost
Format Record for Export
Submit to GitHub / SAQA
Generate Certificate + Audit Log

Code as Logic

VBA: Rule-Based Logic

```
' Algorithmic Mapping: CPD -> Qualification -> Registry ID
Function ValidateBinaryCode(ByVal binCode As String) As Boolean
    Select Case binCode
        Case "00000000000000", "11111111111111"
            ValidateBinaryCode = True
        Case Else
            ValidateBinaryCode = False
    End Select
End Function
```

Central Concept

Fusing data points, such as

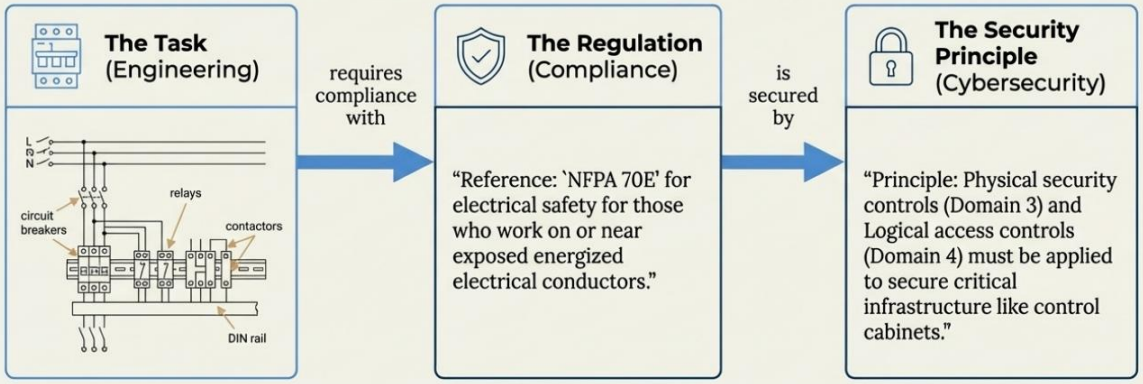
$$F_{ui} = w_o O_{ui} + w_a A_{ui} + w_b B_{ui},$$

allows for weighted analysis of different types of evidence within the framework.

NotebookLM

Case Study 1: Mapping Electrical Systems to Security Compliance

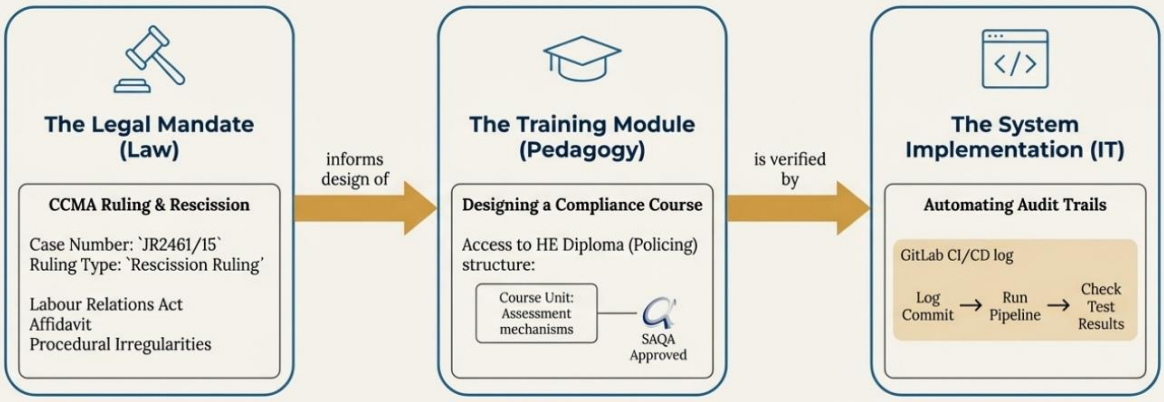
A Logigramme connects a hands-on electrical task to its wider regulatory and security context, creating a complete and auditable competency trail.



NotebookLM

Case Study 2: Integrating Legal Precedent into Training Systems

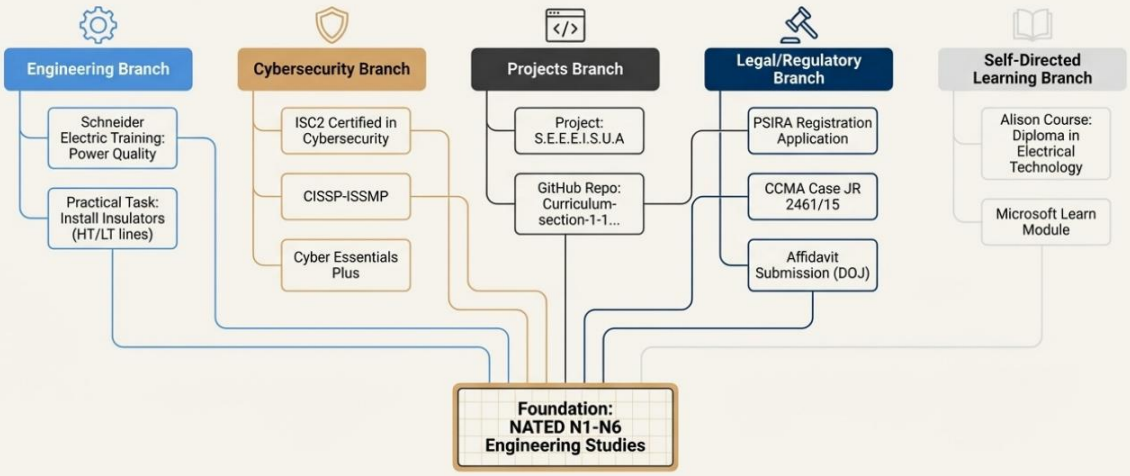
The framework can model complex procedural knowledge, translating legal requirements and dispute resolution outcomes into verifiable training modules and system logic.



NotebookLM

A Unified Career Trajectory: The Logigramme in Practice

When fully implemented, the Logigramme visualizes an entire professional journey, connecting every course, certification, project, and legal interaction into a single, verifiable narrative of competence.



NotebookLM

Beyond the Individual: An Auditable Framework for Organizations

The Logigramme framework scales from individual career mapping to a powerful tool for organizational management, offering unprecedented transparency and efficiency.

For Education & Training Providers

- Map curriculum to industry needs (SAQA/DHET).
- Create auditable learning pathways and automate credential issuance.
- Validate prior learning through evidence-based portfolios.

For Employers & Industry

- Verify candidate skills with granular proof.
- Design precise upskilling programs.
- Manage compliance and track competencies for complex roles (e.g., Systems Security Engineering).

For Regulatory & Legal Bodies

- Streamline compliance audits with verifiable, time-stamped evidence.
- Link legal rulings (CCMA) to required training outcomes.
- Ensure transparent and fair credentialing processes (PSIRA).

NotebookLM

The Core Principles: Transparency, Modularity, and Verification

The framework's strength lies in three foundational principles that ensure its integrity and utility.

1.

1. Transparent & Auditable

- Every entry is time-stamped and linked to source evidence.
- Open-source logic (VBA, algorigrammes) allows for independent verification.
- Outputs are formatted for submission to regulatory bodies like SAQA and archival systems like GitHub.

2.

2. Modular & Scalable

- Competencies are broken into discrete, linkable modules (e.g., `NATED modules`, `CISSP domains`).
- Easily integrates new skills, credentials, or regulations without system overhaul.
- Applicable to any domain requiring verifiable, cross-functional expertise.

3.

3. Integrated by Design

- Connects theory (e.g., `Kirchhoff's Laws`) to practice (`Fault-finding exercises`).
- Links action (`Applying Safety Rules`) to consequence (`Compliance with OSHA`).
- Fuses qualitative data (legal affidavits) with quantitative metrics (assessment scores).

NotebookLM

The Future of Professional Development is Integrated

As careers become more fluid and complex, we need systems that recognize and validate non-linear, multi-disciplinary paths. The Logigramme framework swork is a blueprint for a future where professional value is measured not by siloed credentials, but by a verifiable network of capabilities.

1. AI-Driven Career Pathing

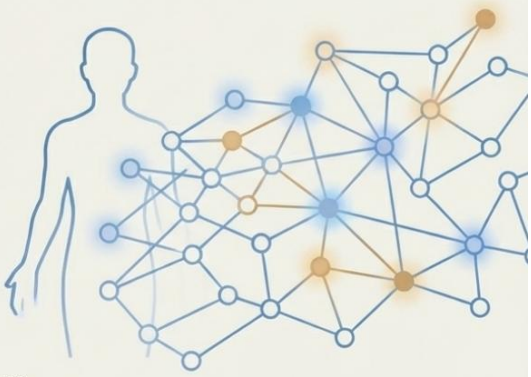
Leveraging AI to analyze logigrammes and recommend personalized upskilling paths, connecting learners to resources from Microsoft, ISACA, and Alison.

2. Dynamic Credentialing

Move beyond static certificates to live, verifiable portfolios that update in real-time with new projects and skills.

3. Organizational Intelligence

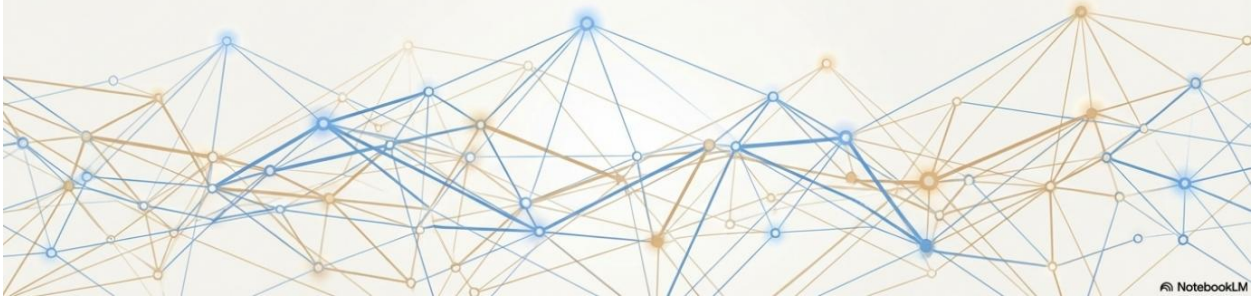
Enable organizations to map their collective capabilities, identify skill gaps, and build more resilient, cross-functional teams.



NotebookLM

Competence is Not a Line. It's a Network.

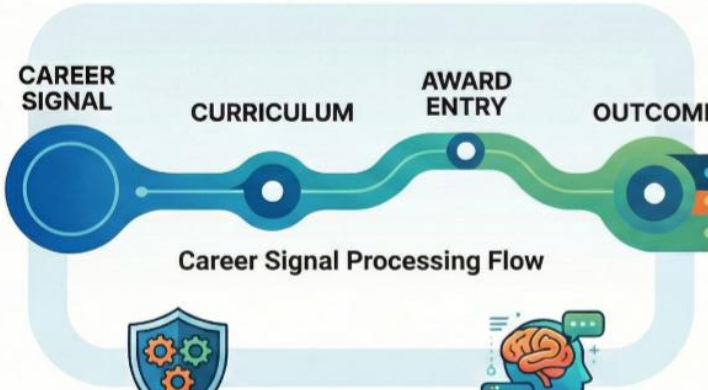
Traditional systems draw lines. They create boundaries between engineering and law, between theory and practice, between education and experience. The future belongs to systems that build networks—connecting every piece of knowledge to create a holistic, undeniable record of expertise.



NotebookLM

Career Drawing Total Programming: A Unified System

THE CORE FRAMEWORK: SIGNAL-DRIVEN CAREER & EDUCATION LOGIC



VALIDATED BY NATIONAL STANDARDS

Integrates with regulatory bodies like SAQA, NATED, and CPD for qualification alignment.

AUTODIDACTIC LEARNING MODEL

Utilizes copilote-assisted systems to support remote, self-directed vocational and academic learning.

KEY APPLICATION DOMAINS

ADVANCED ELECTRICAL ENGINEERING

Applies complex calculus for system analysis, such as using integrals for energy calculations.

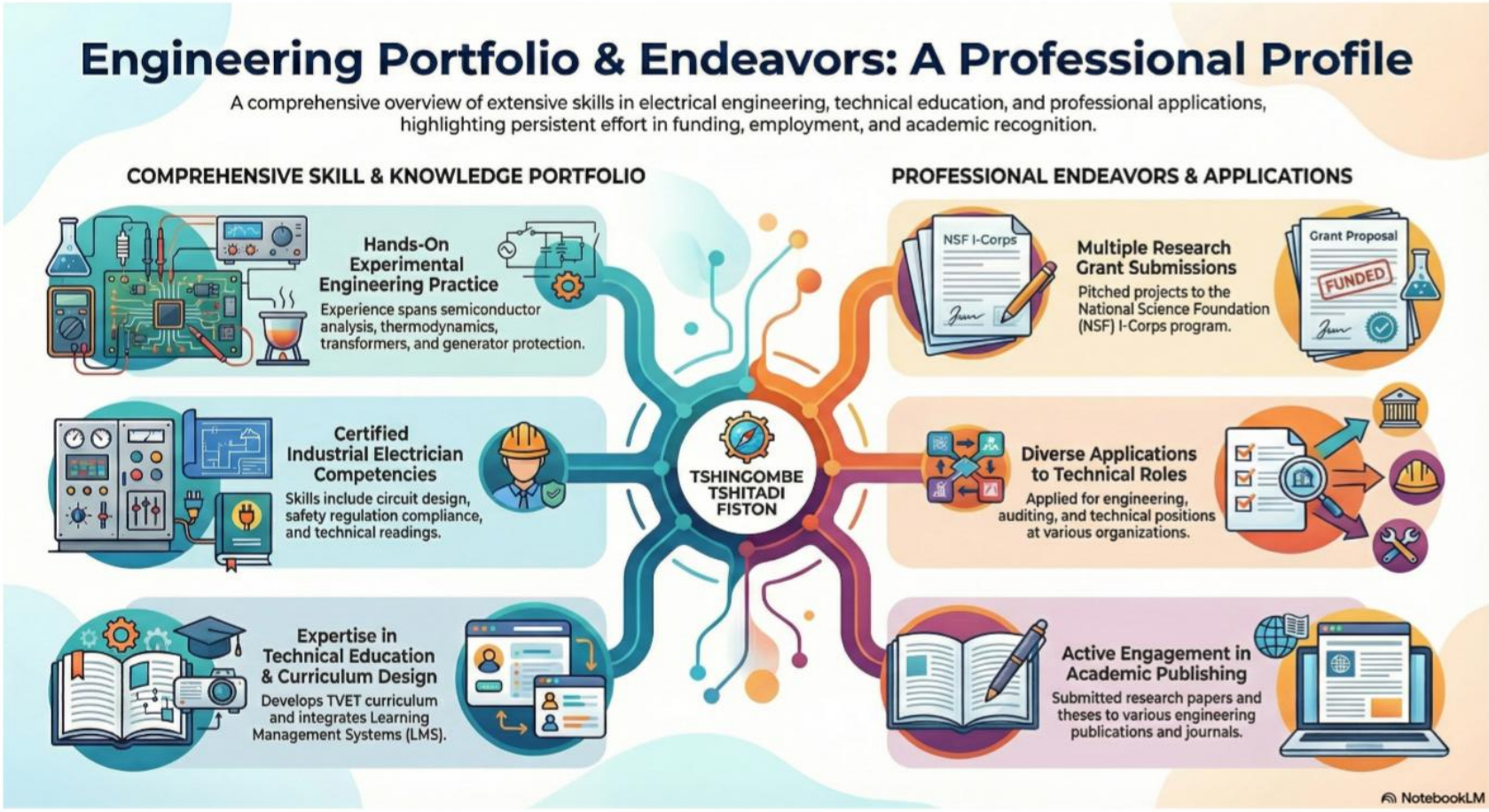
INDUSTRIAL & AUTOMATION CONTROL

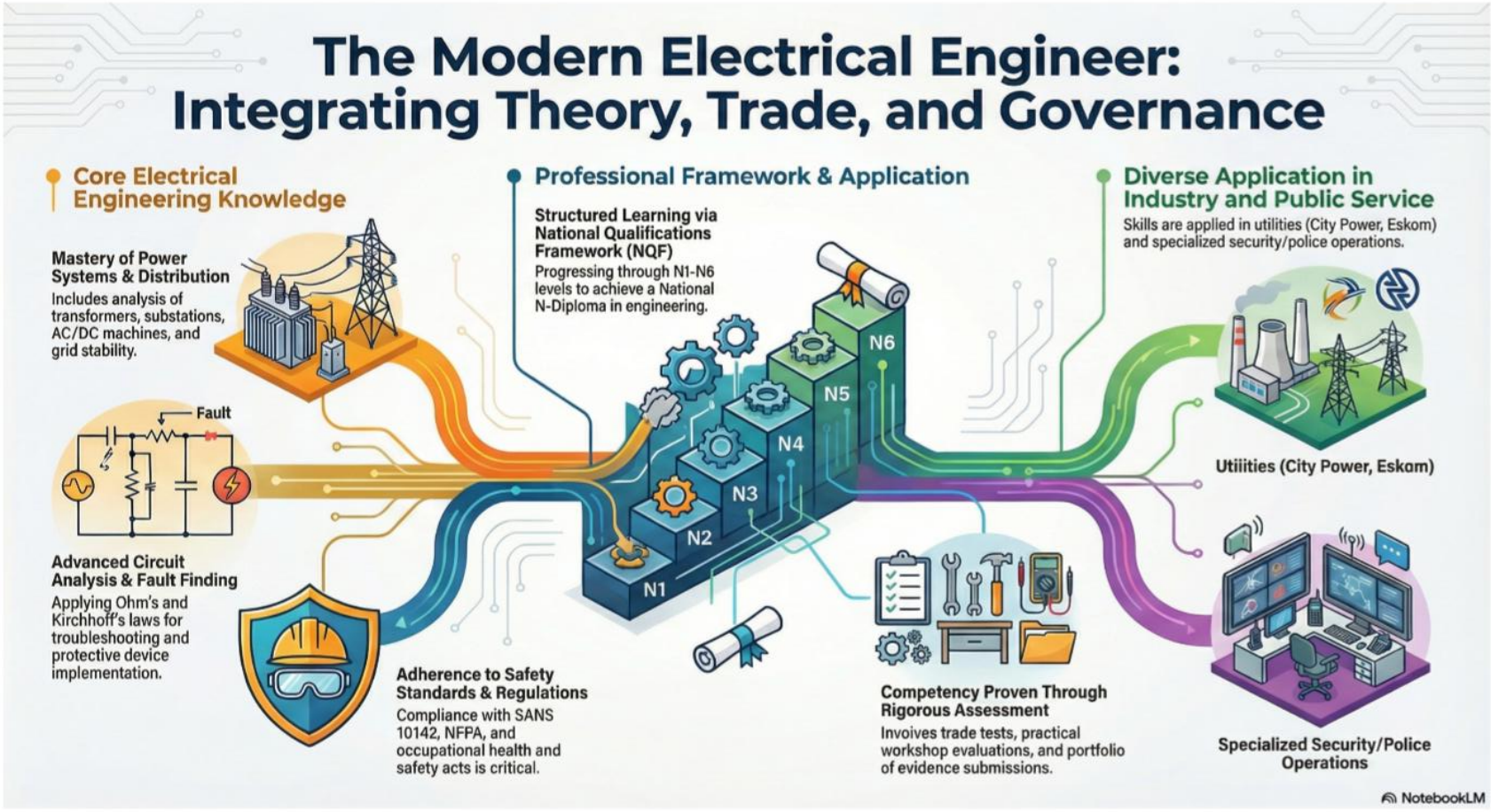
Implements PLC command circuits, SCADA switches, and ATM logic for system diagnostics.

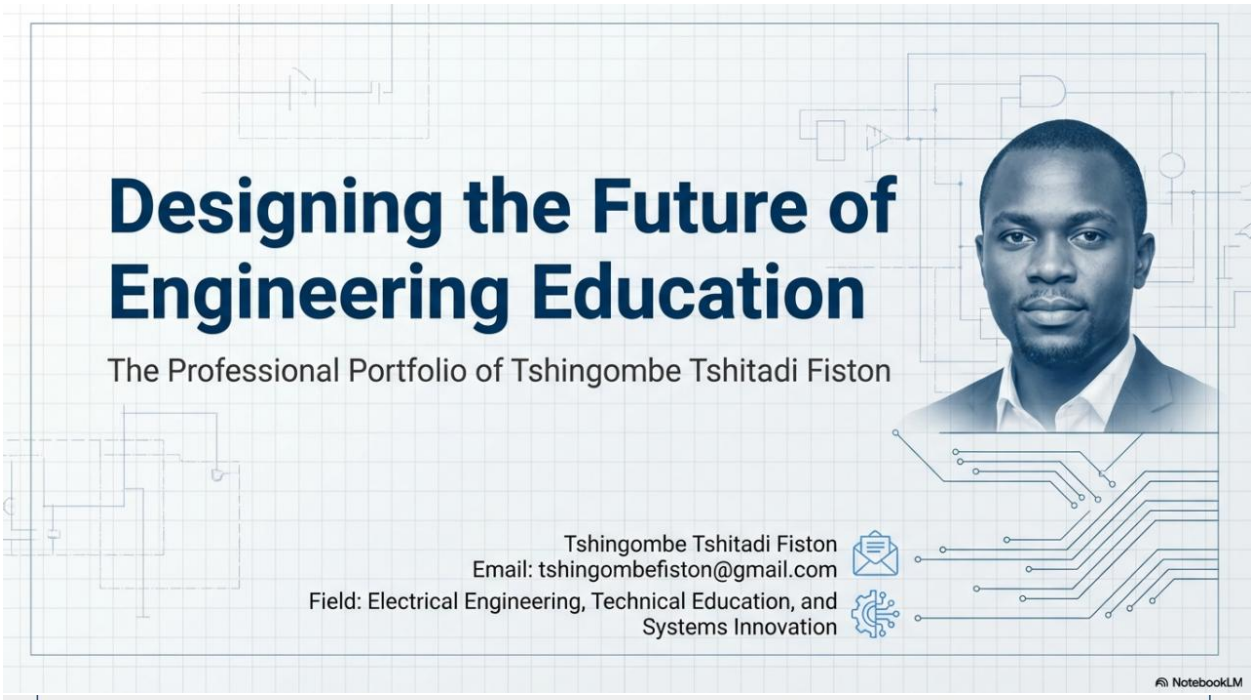
PUBLIC & SECURITY SYSTEMS

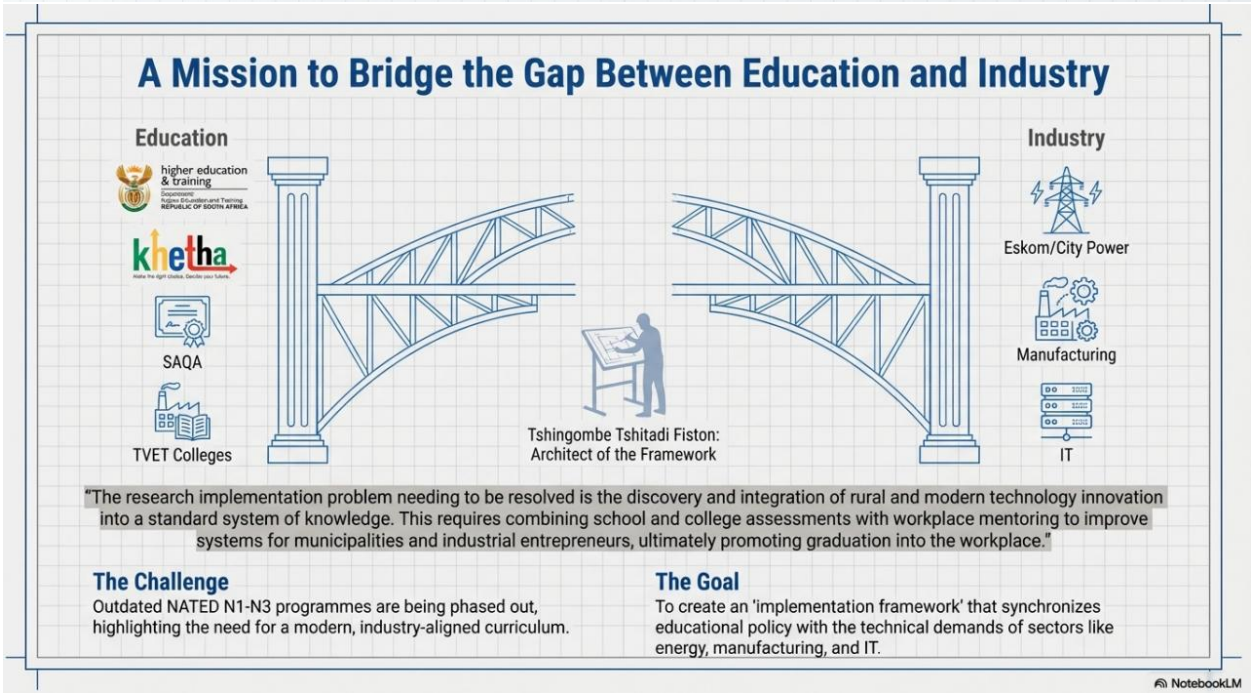
Extends to policing strategies, traffic safety analytics, and military/defense standards (MIL norms).

NotebookLM


Engineering Portfolio & Endeavors: A Professional Profile
A comprehensive overview of extensive skills in electrical engineering, technical education, and professional applications, highlighting persistent effort in funding, employment, and academic recognition.
COMPREHENSIVE SKILL & KNOWLEDGE PORTFOLIO
PROFESSIONAL ENDEAVORS & APPLICATIONS
Hands-On Experimental Engineering Practice
Experience spans semiconductor analysis, thermodynamics, transformers, and generator protection.
Certified Industrial Electrician Competencies
Skills include circuit design, safety regulation compliance, and technical readings.
Expertise in Technical Education & Curriculum Design
Develops TVET curriculum and integrates Learning Management Systems (LMS).
TSHINGOMBE TSHITADI FISTON
NSF I-Corps
Multiple Research Grant Submissions
Pitched projects to the National Science Foundation (NSF) I-Corps program.
Grant Proposal
FUNDED
Diverse Applications to Technical Roles
Applied for engineering, auditing, and technical positions at various organizations.
Active Engagement in Academic Publishing
Submitted research papers and theses to various engineering publications and journals.
NotebookLM


The Modern Electrical Engineer: Integrating Theory, Trade, and Governance
Core Electrical Engineering Knowledge
Mastery of Power Systems & Distribution
Includes analysis of transformers, substations, AC/DC machines, and grid stability.
Fault
Advanced Circuit Analysis & Fault Finding
Applying Ohm's and Kirchhoff's laws for troubleshooting and protective device implementation.
Professional Framework & Application
Structured Learning via National Qualifications Framework (NQF)
Progressing through N1-N6 levels to achieve a National N-Diploma in engineering.
N1
N2
N3
N4
N5
N6
Adherence to Safety Standards & Regulations
Compliance with SANS 10142, NFPA, and occupational health and safety acts is critical.
Competency Proven Through Rigorous Assessment
Invoives trade tests, practical workshop evaluations, and portfolio of evidence submissions.
Diverse Application in Industry and Public Service
Skills are applied in utilities (City Power, Eskom) and specialized security/police operations.
Utiiities (City Power, Eskom)
Specialized Security/Police Operations
NotebookLM


Designing the Future of Engineering Education
The Professional Portfolio of Tshingombe Tshitadi Fiston
Tshingombe Tshitadi Fiston
Email: tshingombefiston@gmail.com
Field: Electrical Engineering, Technical Education, and Systems Innovation
NotebookLM


A Mission to Bridge the Gap Between Education and Industry
Education
higher education & training
khetha
SAQA
TVET Colleges
Tshingombe Tshitadi Fiston:
Architect of the Framework
Industry
Eskom/City Power
Manufacturing
IT
"The research implementation problem needing to be resolved is the discovery and integration of rural and modern technology innovation into a standard system of knowledge. This requires combining school and college assessments with workplace mentoring to improve systems for municipalities and industrial entrepreneurs, ultimately promoting graduation into the workplace."
The Challenge
Outdated NATED N1-N3 programmes are being phased out, highlighting the need for a modern, industry-aligned curriculum.
The Goal
To create an 'implementation framework' that synchronizes educational policy with the technical demands of sectors like energy, manufacturing, and IT.
NotebookLM

Every Blueprint Begins with an Honest Assessment

Numeric Reasoning Test

14%

2 Correct Answers
13 Incorrect Answers

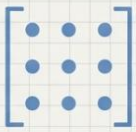
The Response

An early assessment revealed a critical area for development. This result was not a setback, but the starting point for a deliberate and intensive journey to master the mathematical language of engineering.

NotebookLM

Architecting a Foundation in Advanced Mathematics

In response, a systematic study of advanced mathematics was undertaken, moving from foundational principles to their direct application in complex engineering problems.



NATED Mathematics N4

Key modules:

- Determinants (Cramer's Rule)
- Complex Numbers (Rectangular Form)
- Trigonometry (Compound Angles)
- Differential Calculus

NATED Mathematics N6

Key modules:

- Advanced Differentiation (Chain, Product Rules)
- Integration Techniques
- Partial Fractions
- Application to Areas and Volumes

Targeted Upskilling (Alison)

Course Highlight: 'Trigonometry in Electrical Engineering'

Key topics:

- Pythagorean Theorem
- Unit Circle & Trig Identities
- Application of sinusoids to describe current and voltage

This methodical approach transformed a developmental area into a core strength.

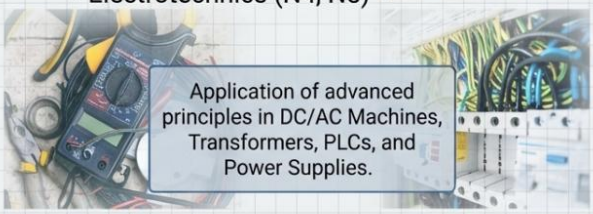
NotebookLM

Mastering the Core Circuitry of Electrical Engineering

Formal NATED Qualifications

National Diploma Pathway (N1-N6)

- Electrical Trade Theory (N2, N3)
- Industrial Electronics (N2, N4, N5)
- Electrotechnics (N4, N5)



Application of advanced principles in DC/AC Machines, Transformers, PLCs, and Power Supplies.

Continuous Professional Development (Alison)

50+ Specialized Modules Completed

Diploma in Electrical Studies	Introduction to Electrical Maintenance	Essentials of Electrical Safety	Introduction to Electrical Wiring Systems
Fundamentals of Electrical Three-Phase Power Transformers	Trigonometry in Electrical Engineering	Fundamental of Basic Electrical Circuits	Introduction to Basic Electrical Drawings and Test Equipment
Electrical Circuit Analysis	DC Motor Fundamentals	AC Motor Fundamentals	Power System Protection
Electrical Safety and Regulations	Troubleshooting Electrical Systems	Advanced Wiring Techniques	Renewable Energy Systems Integration

A comprehensive knowledge base, from fundamental circuits to advanced industrial systems.

NotebookLM

Integrating Digital Intelligence and Future-Ready Skills

High-Level Engineering Software & Automation

Experience with Programmable Logic Controllers (PLCs), developing I/O programs with iterative loops (FOR...DO, REPEAT...UNTIL) and conditional statements.

Modern Software Development

Extensive training in modern development ecosystems via Microsoft Learn.

Azure DevOps | Git | C# | Python | Jupyter Notebooks

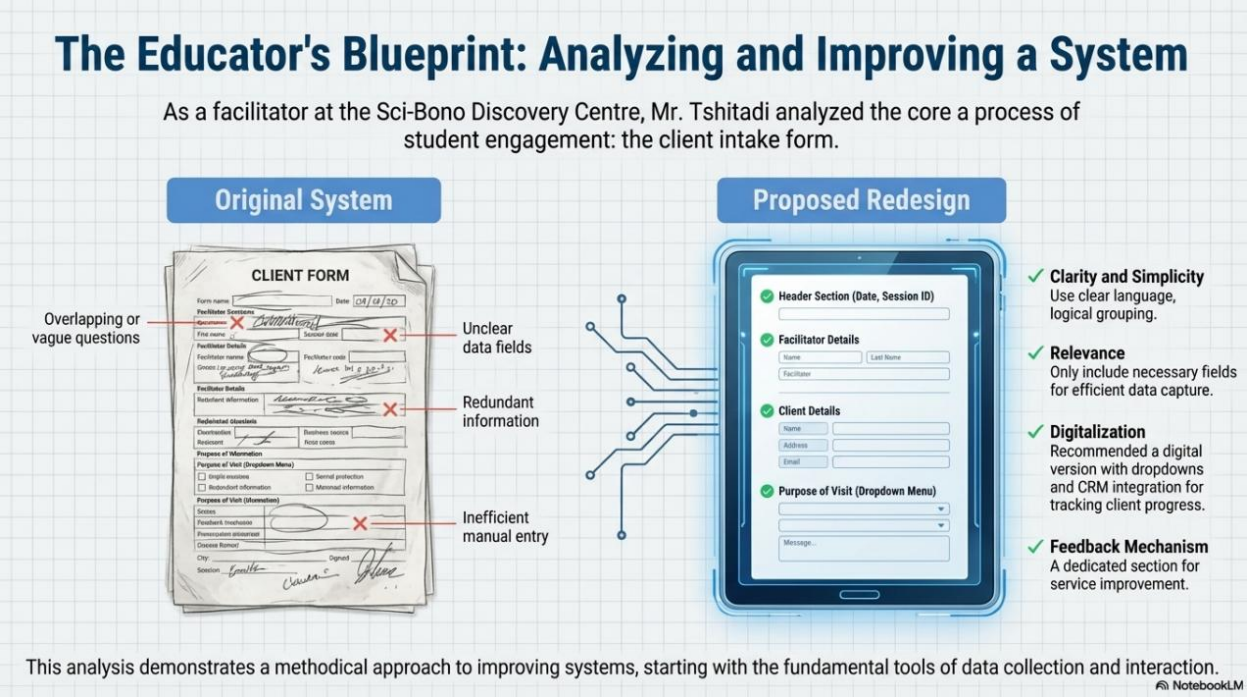
Artificial Intelligence & Machine Learning

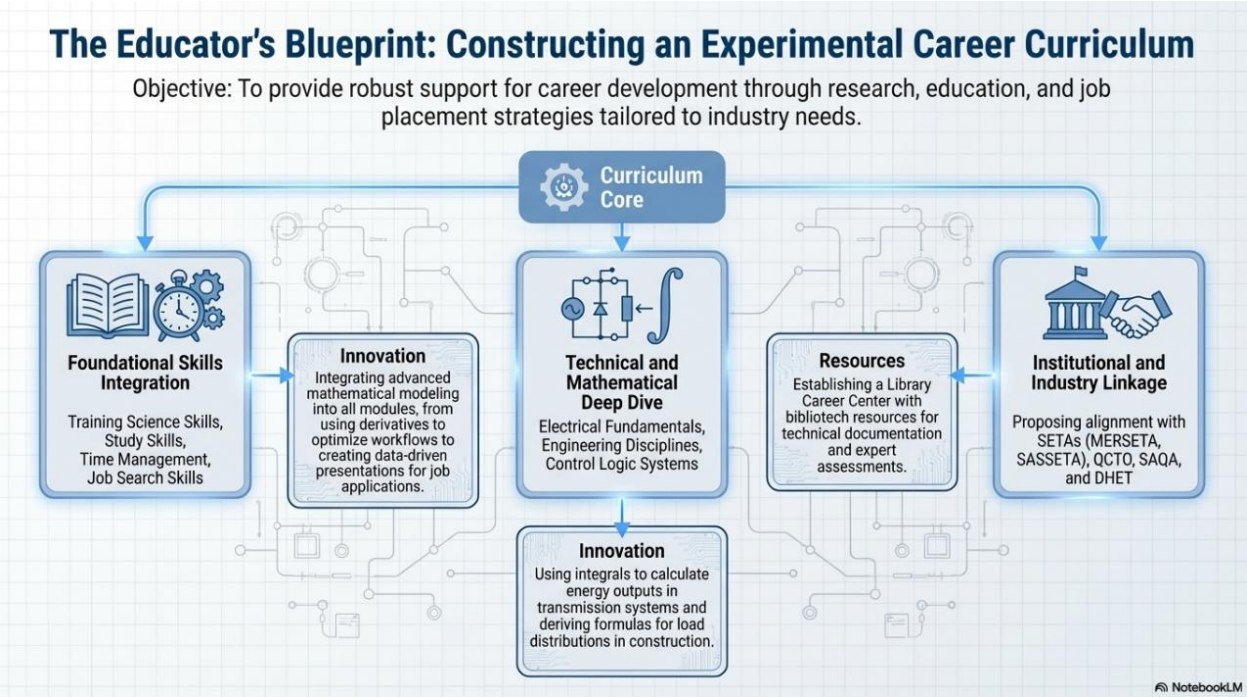
Foundational and applied knowledge in AI via Microsoft Learn.

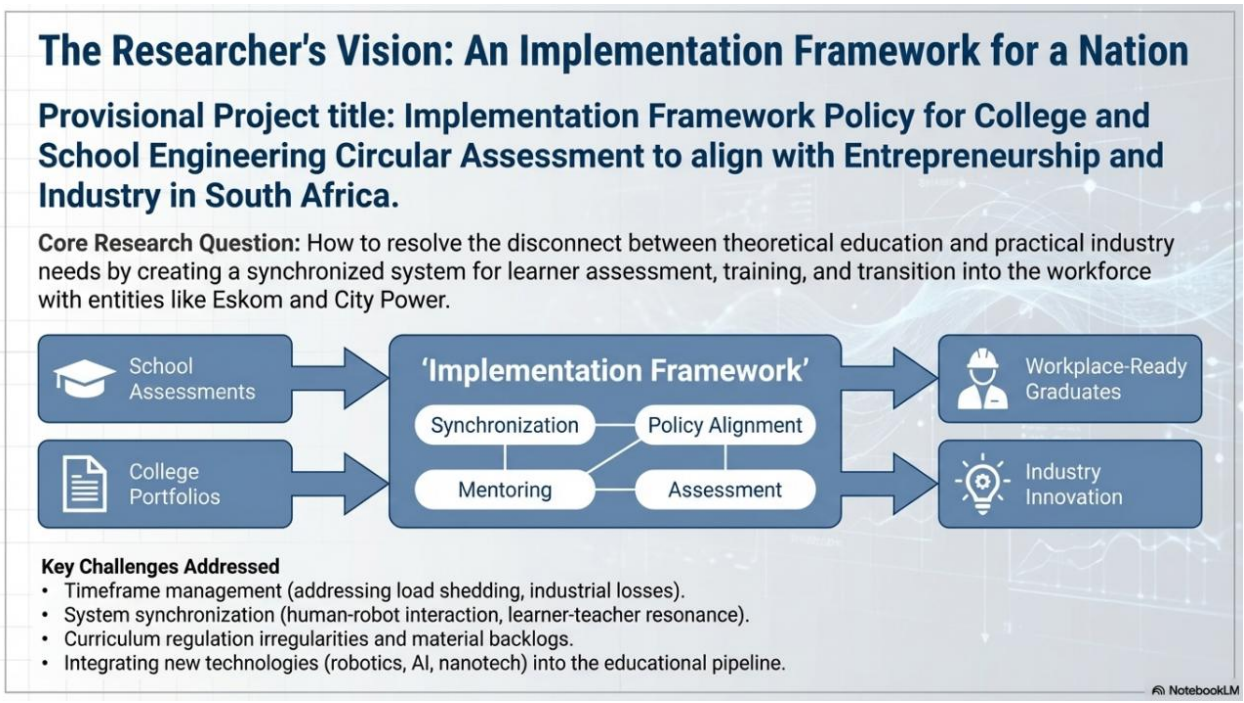
Azure AI Services | PyTorch | Computer Vision (Image Classification, Object Detection)
Natural Language Processing | Supervised & Unsupervised Learning

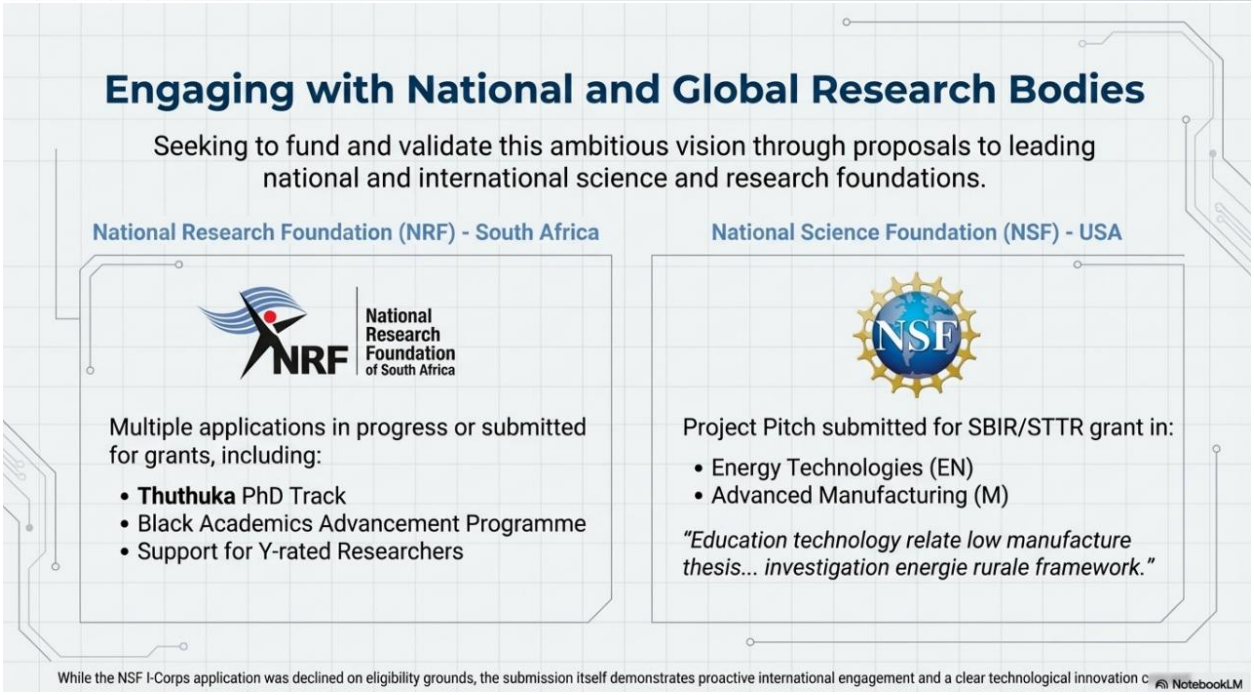
Systematically building the skills to design, automate, and optimize the intelligent systems of the future.

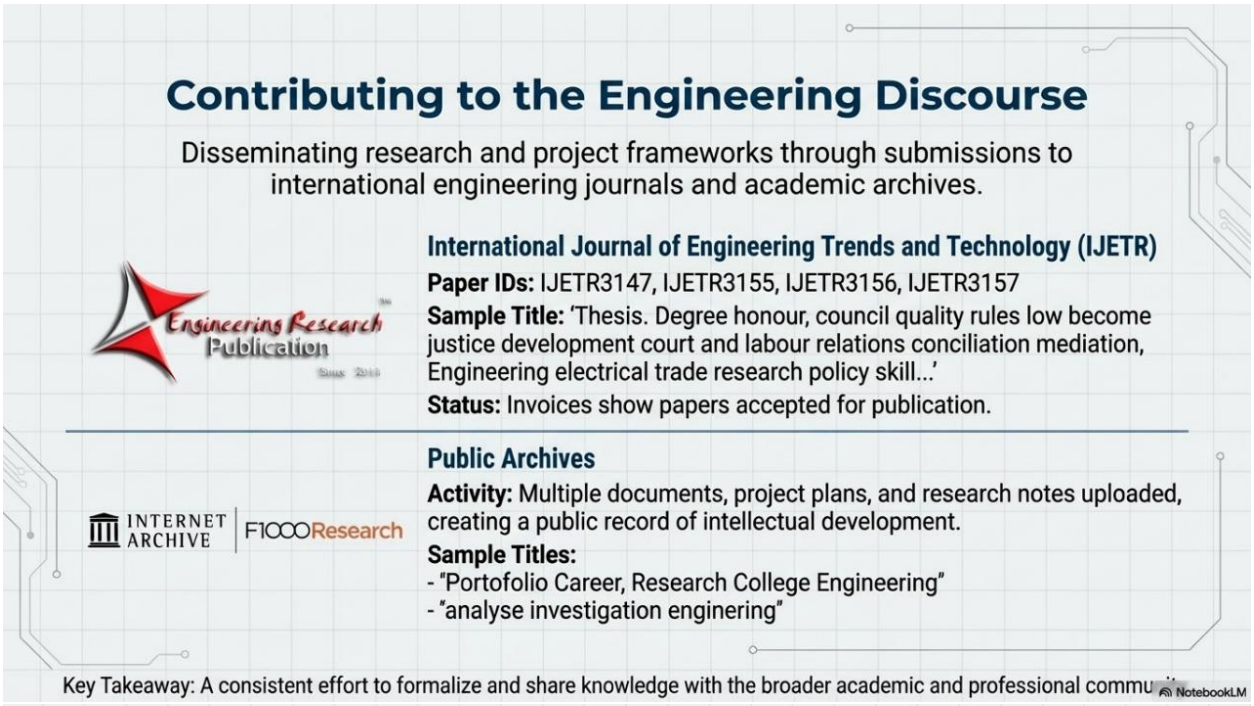
NotebookLM

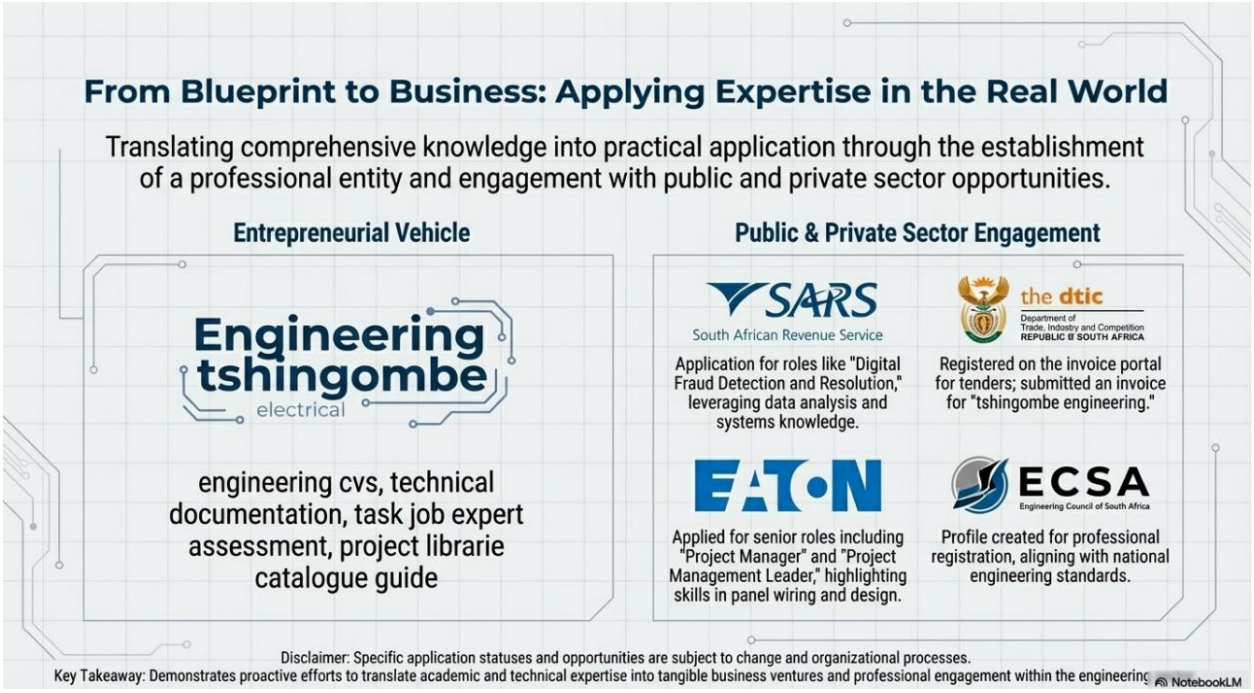

The Educator's Blueprint: Analyzing and Improving a System
As a facilitator at the Sci-Bono Discovery Centre, Mr. Tshitadi analyzed the core a process of student engagement: the client intake form.
Original System
Proposed Redesign
CLIENT FORM
Overlapping or vague questions
Unclear data fields
Redundant information
Inefficient manual entry
Header Section (Date, Session ID)
Facilitator Details
Client Details
Purpose of Visit (Dropdown Menu)
Clarity and Simplicity
Use clear language, logical grouping.
Relevance
Only include necessary fields for efficient data capture.
Digitalization
Recommended a digital version with dropdowns and CRM integration for tracking client progress.
Feedback Mechanism
A dedicated section for service improvement.
This analysis demonstrates a methodical approach to improving systems, starting with the fundamental tools of data collection and interaction.
NotebookLM


The Educator's Blueprint: Constructing an Experimental Career Curriculum
Objective: To provide robust support for career development through research, education, and job placement strategies tailored to industry needs.
Curriculum Core
Foundational Skills Integration
Training Science Skills, Study Skills, Time Management, Job Search Skills
Innovation
Integrating advanced mathematical modeling into all modules, from using derivatives to optimize workflows to creating data-driven presentations for job applications.
Technical and Mathematical Deep Dive
Electrical Fundamentals, Engineering Disciplines, Control Logic Systems
Innovation
Using integrals to calculate energy outputs in transmission systems and deriving formulas for load distributions in construction.
Resources
Establishing a Library Career Center with bibliotech resources for technical documentation and expert assessments.
Institutional and Industry Linkage
Proposing alignment with SETAs (MERSETA, SASSETA), QCTO, SAQA, and DHET
NotebookLM


The Researcher's Vision: An Implementation Framework for a Nation
Provisional Project title: Implementation Framework Policy for College and School Engineering Circular Assessment to align with Entrepreneurship and Industry in South Africa.
Core Research Question: How to resolve the disconnect between theoretical education and practical industry needs by creating a synchronized system for learner assessment, training, and transition into the workforce with entities like Eskom and City Power.
School Assessments
College Portfolios
'Implementation Framework'
Synchronization
Policy Alignment
Mentoring
Assessment
Workplace-Ready Graduates
Industry Innovation
Key Challenges Addressed
• Timeframe management (addressing load shedding, industrial losses).
• System synchronization (human-robot interaction, learner-teacher resonance).
• Curriculum regulation irregularities and material backlogs.
• Integrating new technologies (robotics, AI, nanotech) into the educational pipeline.
NotebookLM


Engaging with National and Global Research Bodies
Seeking to fund and validate this ambitious vision through proposals to leading national and international science and research foundations.
National Research Foundation (NRF) - South Africa
NRF National Research Foundation of South Africa
Multiple applications in progress or submitted for grants, including:
• Thuthuka PhD Track
• Black Academics Advancement Programme
• Support for Y-rated Researchers
National Science Foundation (NSF) - USA
NSF
Project Pitch submitted for SBIR/STTR grant in:
• Energy Technologies (EN)
• Advanced Manufacturing (M)
"Education technology relate low manufacture thesis... investigation energie rurale framework."
While the NSF I-Corps application was declined on eligibility grounds, the submission itself demonstrates proactive international engagement and a clear technological innovation c
NotebookLM


Contributing to the Engineering Discourse
Disseminating research and project frameworks through submissions to international engineering journals and academic archives.
International Journal of Engineering Trends and Technology (IJETR)
Paper IDs: IJETR3147, IJETR3155, IJETR3156, IJETR3157
Sample Title: 'Thesis. Degree honour, council quality rules low become justice development court and labour relations conciliation mediation, Engineering electrical trade research policy skill...'
Status: Invoices show papers accepted for publication.
Public Archives
Activity: Multiple documents, project plans, and research notes uploaded, creating a public record of intellectual development.
Sample Titles:
- "Portofolio Career, Research College Engineering"
- "analyse investigation enginering"
Key Takeaway: A consistent effort to formalize and share knowledge with the broader academic and professional commu
NotebookLM


From Blueprint to Business: Applying Expertise in the Real World
Translating comprehensive knowledge into practical application through the establishment of a professional entity and engagement with public and private sector opportunities.
Entrepreneurial Vehicle
Engineering tshingombe electrical
engineering cvs, technical documentation, task job expert assessment, project librarie catalogue guide
Public & Private Sector Engagement
SARS South African Revenue Service
Application for roles like "Digital Fraud Detection and Resolution," leveraging data analysis and systems knowledge.
the dtic Department of Trade, Industry and Competition REPUBLIC OF SOUTH AFRICA
Registered on the invoice portal for tenders; submitted an invoice for "tshingombe engineering."
EATON
Applied for senior roles including "Project Manager" and "Project Management Leader," highlighting skills in panel wiring and design.
ECSA Engineering Council of South Africa
Profile created for professional registration, aligning with national engineering standards.
Disclaimer: Specific application statuses and opportunities are subject to change and organizational processes.
Key Takeaway: Demonstrates proactive efforts to translate academic and technical expertise into tangible business ventures and professional engagement within the engineering
NotebookLM

The Unending Pursuit of Knowledge: The Next Chapter

Congratulations on Becoming a Guest Student at Atlantic International University

Pursuing **Master's and Doctoral** degrees in Science and Electrical Engineering.

From Idea to Reality: A Comprehensive Guide to Setting Up Your Own Company

Montessori Beyond the Materials

"Your choice reflects initiative, ambition, and a commitment to personal growth. As a Guest Student, you now have the freedom to explore courses that inspire you, gain valuable skills, and experience the flexibility of online learning."

**From the AIU Welcome Letter*

This commitment to doctoral-level research solidifies the transition from a practitioner to a leader poised to shape the future of the field.

NotebookLM

The Integrated Professional: Engineer, Educator, Researcher, Visionary

Engineer

Deep expertise in Electrical Engineering, from NATED Diplomas to advanced applications in digital systems and renewable energy.

Educator

Proven ability to analyze, deconstruct, and redesign educational systems and curricula to meet modern industry demands.

Researcher

A clear and ambitious research agenda aimed at solving systemic challenges in South Africa's technical education landscape, evidenced by journal submissions and grant applications.

Lifelong Learner

A relentless drive for self-improvement, from overcoming initial skill gaps to pursuing doctoral-level studies.

A career methodically designed and built to construct the future of engineering education in South Africa.

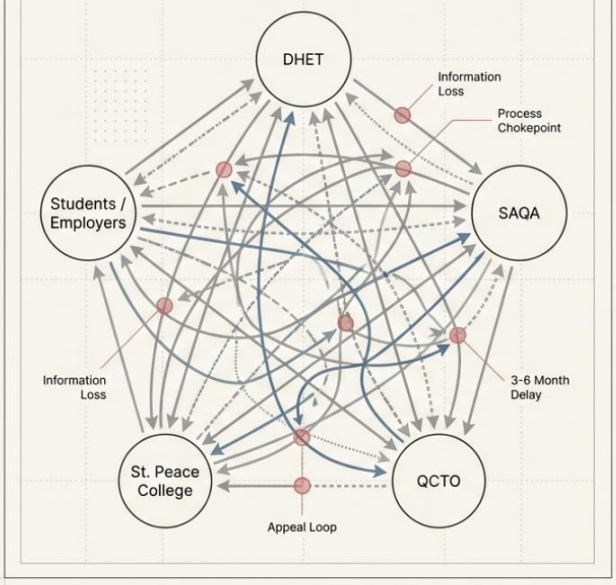
NotebookLM

From Fractured Records to a Unified Career Ledger

Architecting a New Framework for South Africa's Technical Professionals

This presentation documents a systemic failure within South Africa's TVET framework through a direct case study. It proposes a robust, integrated solution built on modern systems architecture to restore integrity, transparency, and efficiency to professional credentialing.

NotebookLM



The Systemic Fracture: Navigating the TVET Labyrinth

- **Fragmented Communication:** Disconnected processes between DHET, SAQA, colleges, and learners lead to significant information loss and delays.
- **Systemic Latency:** Official correspondence reveals a minimum waiting period of 3-6 months for diploma applications, with DHET confirming "the issuance of NN Diploma is currently paused."
- **Opaque Processes:** Lack of clear, standardized protocols for marking, re-marking, and credential combination undermines the integrity of qualifications.
- **Communication Breakdown:** Evidence of critical system failures, such as undeliverable emails to the DHET fraud hotline (`fraudhotline@dhet.co.za`), indicates infrastructural decay. (Reference: Mail Delivery Subsystem error messages).

NotebookLM

Exhibit A: Anatomy of a Systemic Failure – A Case Study Dossier

Exhibit 1: Assessment Irregularities

Documents include "allegations irregularity letter," "appeal statement result award," and records of inconsistent marking protocols. The St. Peace College logo is associated with these documents.

Source Serif Pro Regular Ref: Pocket Section 1, 3

Exhibit 2: Accreditation & Recognition Failure

"SAQA purpose accreditation non creditable" and "explanation return fund letter" highlight systemic breakdowns in the validation and recognition of qualifications.

Source Serif Pro Regular Ref: Pocket Section 2

Exhibit 3: Bureaucratic Dead Ends

A documented complaint to the Inspector General of Intelligence regarding deleted college records was formally dismissed as being outside their mandate, revealing a lack of clear recourse for systemic failures.

Source Serif Pro Regular Ref: OIGI/IG10(IG80)/6/1/14/5

Exhibit 4: Delayed & Contradictory Outcomes

SITA incident report `INC000025277051` states the candidate "does not qualify for a certificate," directly conflicting with other records showing a pass and subsequent appeals, highlighting severe data integrity conflicts.

Source Serif Pro Regular Ref: SITA INC000025277051

NotebookLM

The Architect's Credentials: A Multi-Domain Skillset

Electrical Engineering

- **Core Theory:** AC/DC machines, power transmission, industrial electronics, electrotechnology.
- **Practical Application:** Logbooks from projects with City Power, Eskom. Certifications from Schneider Electric (EcoStruxure, Altivar) and Eaton University.
- **Compliance:** Deep knowledge of SANS/ISO standards (9001, 50001), SABS, and international marks (CEBEC, ENEC).

Systems Architecture & Programming

- **Automation:** Expertise in Visual Basic (VBA) for creating custom management systems, dashboards, and audit trails.
- **Process Modeling:** Design of **`Logigrammes`** (flowcharts) and **`Algorigrammes`** (decision logic) for system traceability.
- **Ecosystem Integration:** Architect of solutions within Microsoft Azure DevOps, GitHub/GitLab, Salesforce, and Tableau.

Legal & Regulatory Analysis

- **Compliance Frameworks:** Direct engagement with DHET, SAQA, QCTO, and SETA regulations.
- **Formal Procedures:** Experience with Freedom of Information (FOI) requests (Metropolitan Police UK), affidavits, and civil case filings (DOJ).
- **International Standards:** Knowledge of PSIRA, SASSETA, and intellectual property (IP) licensing.

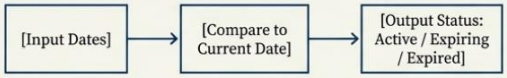
Source Serif Pro Regular
NotebookLM

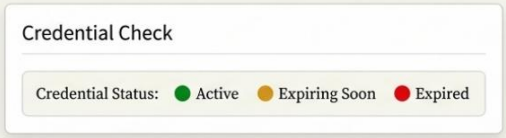
From Code to Control: Demonstrating Technical Prowess

The Engine (VBA Code Snippet)

```
' Function to Determine Credential Status
Function DetermineCredentialStatus(issueDate As Date, expiryDate As Date) As String
    If Date > expiryDate Then
        DetermineCredentialStatus = "Expired"
    ElseIf Date >= DateAdd("m", -1, expiryDate) Then
        DetermineCredentialStatus = "Expiring Soon"
    Else
        DetermineCredentialStatus = "Active"
    End If
End Function
```

The Interface (Logic & UI Concept)



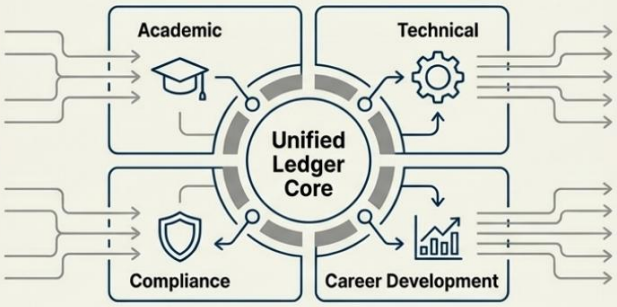


Purpose: This module automates the validation of certifications for entities like SAPS, JMPD, and PSIRA, ensuring compliance and eliminating manual checks. It forms a core component of the proposed automated ledger system.

NotebookLM

The Blueprint: A Unified Credential & Career Ledger

Consolidating Academic, Technical, and Compliance Records into a Single Source of Truth



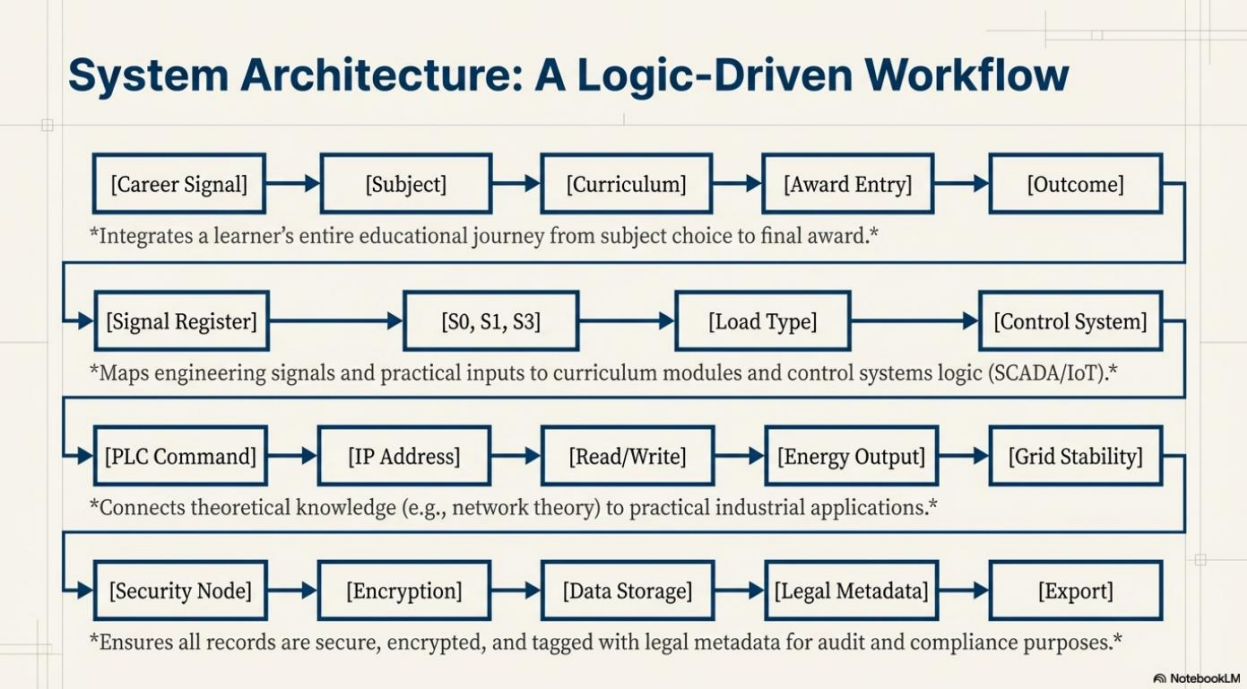
Credential Integrity: Centralized bookkeeping for all diplomas, modules, and certifications (e.g., DHET, Alison, Microsoft, SASSETA).

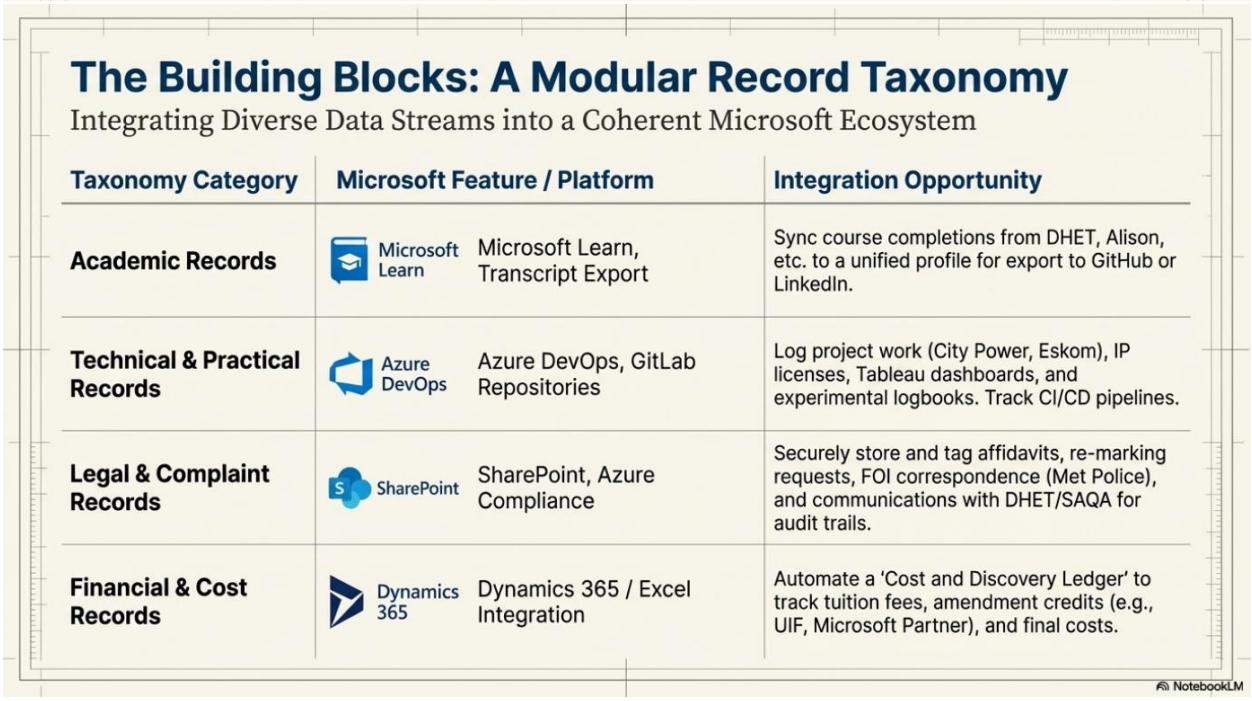
Curriculum & Thesis Management: Mapping curriculum, tracking thesis milestones, and managing bibliographic data.

Automated Audit & Compliance: Generating audit-ready, traceable records for regulatory bodies (SAQA, QCTO, SETAs).

Dynamic Career Development: Enabling export of verified records to career platforms, learning management systems (LMS), and employers.

NotebookLM


System Architecture: A Logic-Driven Workflow
[Career Signal]
[Subject]
[Curriculum]
[Award Entry]
[Outcome]
Integrates a learner's entire educational journey from subject choice to final award.
[Signal Register]
[S0, S1, S3]
[Load Type]
[Control System]
Maps engineering signals and practical inputs to curriculum modules and control systems logic (SCADA/IoT).
[PLC Command]
[IP Address]
[Read/Write]
[Energy Output]
[Grid Stability]
Connects theoretical knowledge (e.g., network theory) to practical industrial applications.
[Security Node]
[Encryption]
[Data Storage]
[Legal Metadata]
[Export]
Ensures all records are secure, encrypted, and tagged with legal metadata for audit and compliance purposes.
NotebookLM

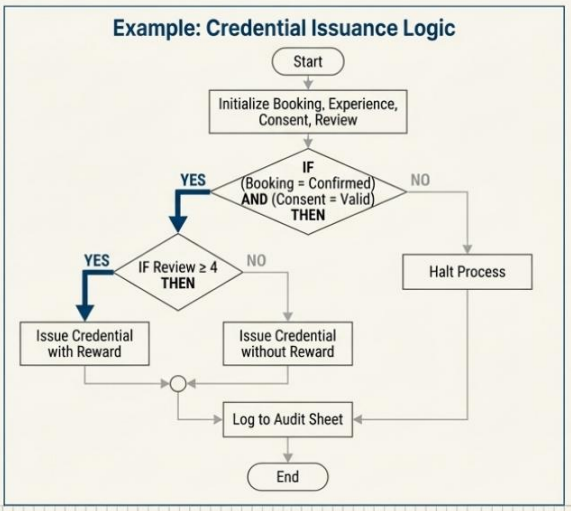

The Building Blocks: A Modular Record Taxonomy
Integrating Diverse Data Streams into a Coherent Microsoft Ecosystem
Taxonomy Category
Microsoft Feature / Platform
Integration Opportunity
Academic Records
Microsoft Learn
Microsoft Learn, Transcript Export
Sync course completions from DHET, Alison, etc. to a unified profile for export to GitHub or LinkedIn.
Technical & Practical Records
Azure DevOps
Azure DevOps, GitLab Repositories
Log project work (City Power, Eskom), IP licenses, Tableau dashboards, and experimental logbooks. Track CI/CD pipelines.
Legal & Complaint Records
SharePoint
SharePoint, Azure Compliance
Securely store and tag affidavits, re-marking requests, FOI correspondence (Met Police), and communications with DHET/SAQA for audit trails.
Financial & Cost Records
Dynamics 365
Dynamics 365 / Excel Integration
Automate a 'Cost and Discovery Ledger' to track tuition fees, amendment credits (e.g., UIF, Microsoft Partner), and final costs.
NotebookLM

A Practical Application: The Certification Dashboard

- **Unified View:** Consolidates over 100 completed modules from diverse sources (Electrical Engineering, Law, Safety, Data Analytics) into a single interface.
- **Metadata Rich:** Each entry includes Title, Completion Date, Category (e.g., NQF Level, CPD), and an image/link to the original certificate.
- **Dynamic Filtering & Analysis:** Allows users to filter by category or date to analyze completion trends and identify skill gaps.
- **One-Click Export:** Enables generation of a full transcript (DOCX/PDF), individual certificates, or a bibliographic record (BibTeX/XML) for academic or professional use.

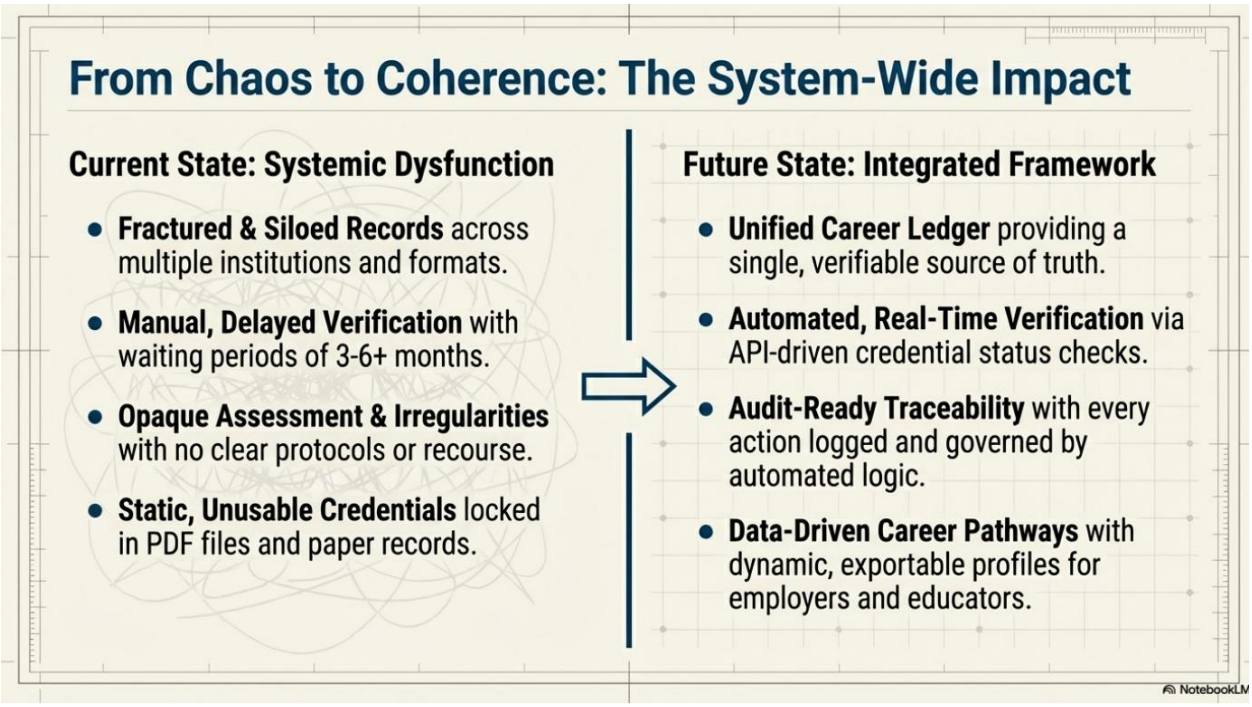
The System's Intelligence: Automated Logic and Compliance

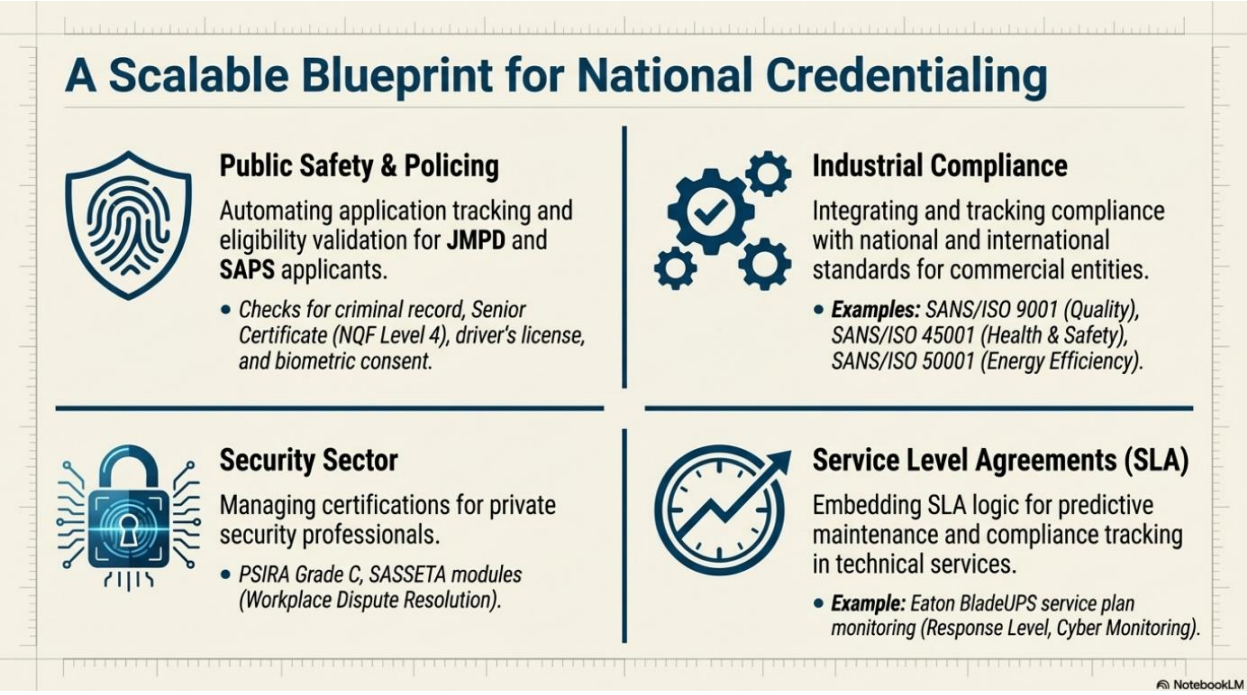
Algorigramme: Automated Logic

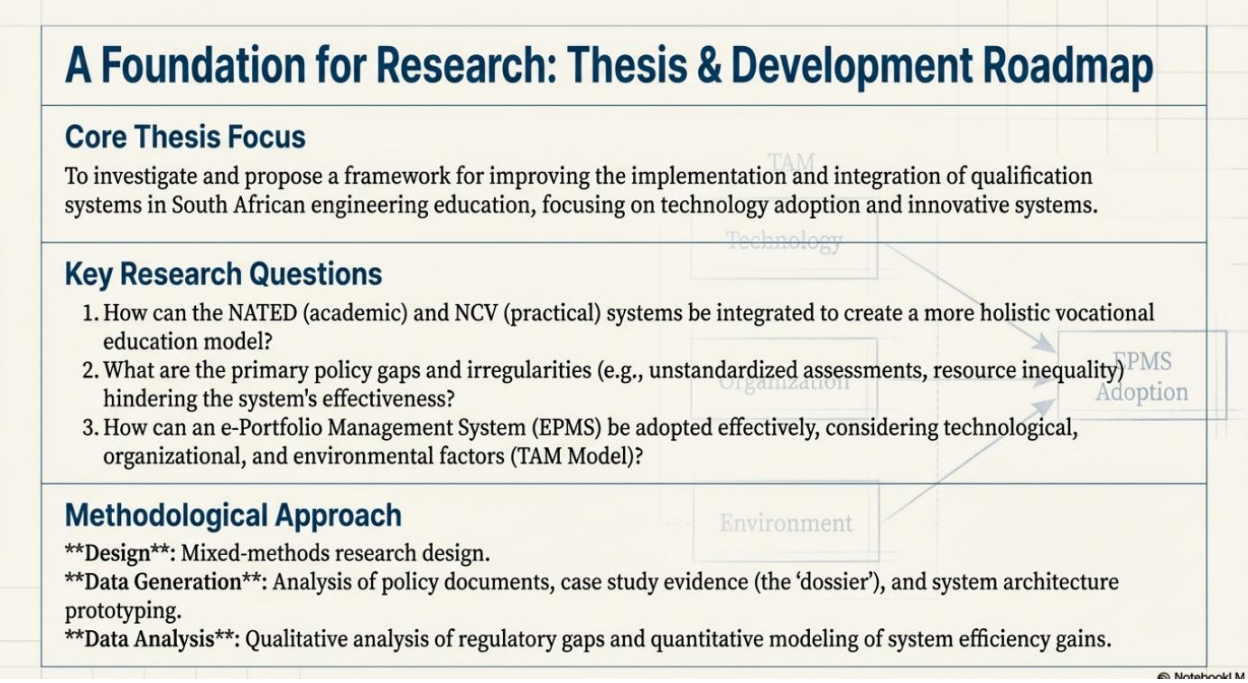


Key Advantages

- **Ensures Standardization**: Applies the same rules to every case, eliminating human error and bias in assessment and issuance.
- **Creates Audit Trails**: Every decision point is logged, providing full traceability for compliance audits by SAQA or other bodies.
- **Enforces Prerequisites**: Automatically checks for necessary inputs (e.g., valid consent, confirmed booking) before proceeding, preventing procedural errors.

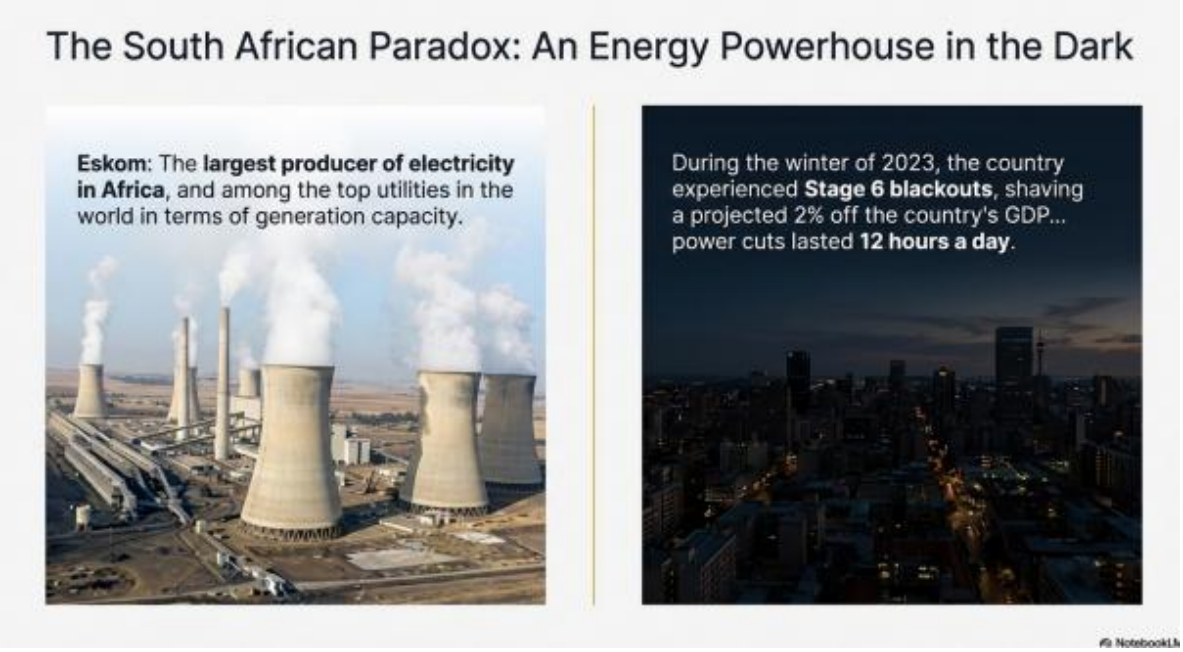

From Chaos to Coherence: The System-Wide Impact
Current State: Systemic Dysfunction
Fractured & Siloed Records across multiple institutions and formats.
Manual, Delayed Verification with waiting periods of 3-6+ months.
Opaque Assessment & Irregularities with no clear protocols or recourse.
Static, Unusable Credentials locked in PDF files and paper records.
Future State: Integrated Framework
Unified Career Ledger providing a single, verifiable source of truth.
Automated, Real-Time Verification via API-driven credential status checks.
Audit-Ready Traceability with every action logged and governed by automated logic.
Data-Driven Career Pathways with dynamic, exportable profiles for employers and educators.
NotebookLM


A Scalable Blueprint for National Credentialing
Public Safety & Policing
Automating application tracking and eligibility validation for JMPD and SAPS applicants.
Checks for criminal record, Senior Certificate (NQF Level 4), driver's license, and biometric consent.
Industrial Compliance
Integrating and tracking compliance with national and international standards for commercial entities.
Examples: SANS/ISO 9001 (Quality), SANS/ISO 45001 (Health & Safety), SANS/ISO 50001 (Energy Efficiency).
Security Sector
Managing certifications for private security professionals.
PSIRA Grade C, SASSETA modules (Workplace Dispute Resolution).
Service Level Agreements (SLA)
Embedding SLA logic for predictive maintenance and compliance tracking in technical services.
Example: Eaton BladeUPS service plan monitoring (Response Level, Cyber Monitoring).
NotebookLM

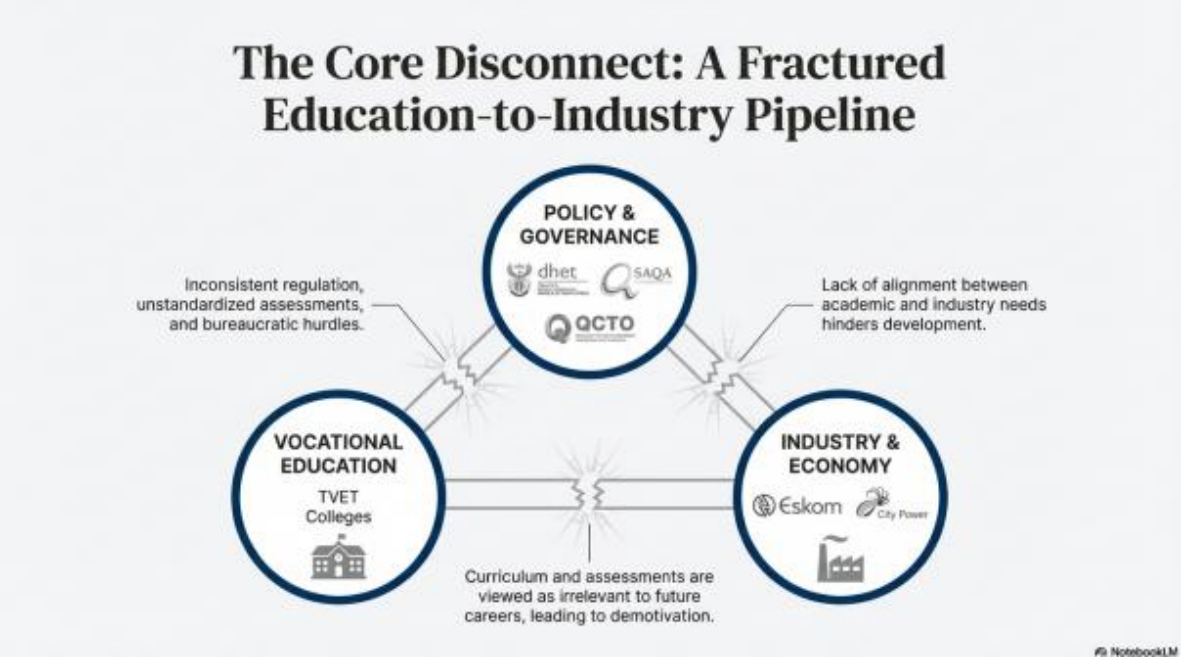

A Foundation for Research: Thesis & Development Roadmap
Core Thesis Focus
To investigate and propose a framework for improving the implementation and integration of qualification systems in South African engineering education, focusing on technology adoption and innovative systems.
Key Research Questions
1. How can the NATED (academic) and NCV (practical) systems be integrated to create a more holistic vocational education model?
2. What are the primary policy gaps and irregularities (e.g., unstandardized assessments, resource inequality) hindering the system's effectiveness?
3. How can an e-Portfolio Management System (EPMS) be adopted effectively, considering technological, organizational, and environmental factors (TAM Model)?
Methodological Approach
Design: Mixed-methods research design.
Data Generation: Analysis of policy documents, case study evidence (the 'dossier'), and system architecture prototyping.
Data Analysis: Qualitative analysis of regulatory gaps and quantitative modeling of system efficiency gains.
TAM
Technology
Organization
Environment
EPMS Adoption

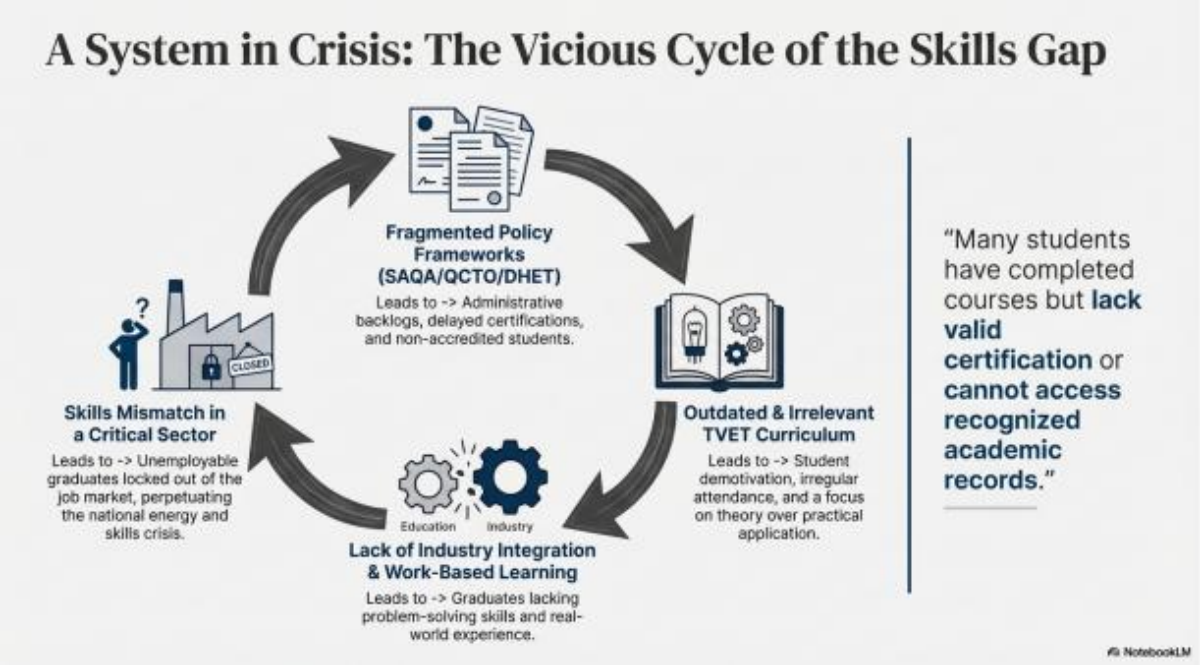
The Architect's Mandate: Building the Future of South African Skills
The extensive evidence of systemic failure is not an indictment, but an invaluable data set. The personal journey through this fractured landscape has provided the unique insights required to architect its replacement. The proposed framework is more than a solution to existing problems; it is a strategic platform for a future where South Africa's technical talent is cultivated, verified, and deplo-deployed with the integrity and efficiency the nation requires. By integrating systems engineering, AI-driven automation, and a robust legal-compliance engine, we can build a national career ledger that is both resilient and responsive to the demands of the 4th Industrial Revolution.
NotebookLM

Powering the Future: An Integrated Framework for South Africa's Engineering Talent and Energy Sector
A proposal to synchronize vocational education with national industrial and energy priorities.
NotebookLM


The South African Paradox: An Energy Powerhouse in the Dark
Eskom: The largest producer of electricity in Africa, and among the top utilities in the world in terms of generation capacity.
During the winter of 2023, the country experienced Stage 6 blackouts, shaving a projected 2% off the country's GDP... power cuts lasted 12 hours a day.

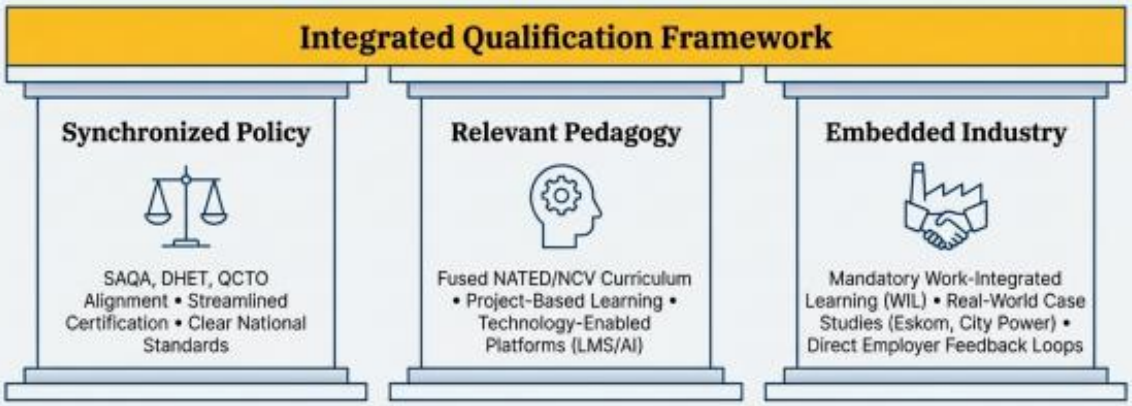
J


The Core Disconnect: A Fractured Education-to-Industry Pipeline
POLICY & GOVERNANCE
dhet
SAQA
QCTO
Inconsistent regulation, unstandardized assessments, and bureaucratic hurdles.
Lack of alignment between academic and industry needs hinders development.
VOCATIONAL EDUCATION
TVET Colleges
INDUSTRY & ECONOMY
Eskom
City Power
Curriculum and assessments are viewed as irrelevant to future careers, leading to demotivation.
NotebookLM


A System in Crisis: The Vicious Cycle of the Skills Gap
Fragmented Policy Frameworks (SAQA/QCTO/DHET)
Leads to -> Administrative backlogs, delayed certifications, and non-accredited students.
Outdated & Irrelevant TVET Curriculum
Leads to -> Student demotivation, irregular attendance, and a focus on theory over practical application.
Lack of Industry Integration & Work-Based Learning
Education
Industry
Leads to -> Graduates lacking problem-solving skills and real-world experience.
Skills Mismatch in a Critical Sector
Leads to -> Unemployable graduates locked out of the job market, perpetuating the national energy and skills crisis.
CLOSED
"Many students have completed courses but lack valid certification or cannot access recognized academic records."
NotebookLM

The Blueprint for Change: An Integrated National Qualification Framework

Proposing a unified framework that synchronizes educational policy, vocational training, and industry requirements to build a future-ready technical workforce.


Integrated Qualification Framework
Synchronized Policy
SAQA, DHET, QCTO Alignment • Streamlined Certification • Clear National Standards
Relevant Pedagogy
Fused NATED/NCV Curriculum • Project-Based Learning • Technology-Enabled Platforms (LMS/AI)
Embedded Industry
Mandatory Work-Integrated Learning (WIL) • Real-World Case Studies (Eskom, City Power) • Direct Employer Feedback Loops

Forging a Virtuous Cycle of Skill and Innovation

Integrated and Relevant Curriculum (NATED+NCV)
Engaged students acquire in-demand theoretical knowledge and practical skills (e.g., wiring, PLC programming, solar installation).
Leads to
Seamless Industry Collaboration (WIL)
Students gain hands-on experience, bridging the gap between classroom and workplace.
Leads to
Efficient, Credible Certification (SAQA/QCTO)
Graduates receive timely, nationally recognized qualifications, unlocking access to the job market.
Leads to
A Skilled, Employable Workforce
Industry gains competent engineers to solve critical challenges (e.g., load shedding, grid modernization), driving economic growth and reinvestment in education.
Leads to

Curriculum in Action: Building Mastery in Advanced Power Engineering

Power Systems & Theory

- Power System Stability & Control (Swing Equation)
- Electromagnetism (Biot-Savart Law)
- Three-Phase Transformer & Induction Motor Theory
- Signal Processing & Stochastic Processes

Power Electronics & Control Systems

- Digital Control Systems & Microprocessors
- DC-DC Converters (Buck/Boost Design)
- DC-AC Inverters (PWM Techniques)
- Programmable Logic Controllers (PLCs)

$$\cos(\varphi) = \frac{P}{S}$$

Power Factor Equation (Eq. 3-9)

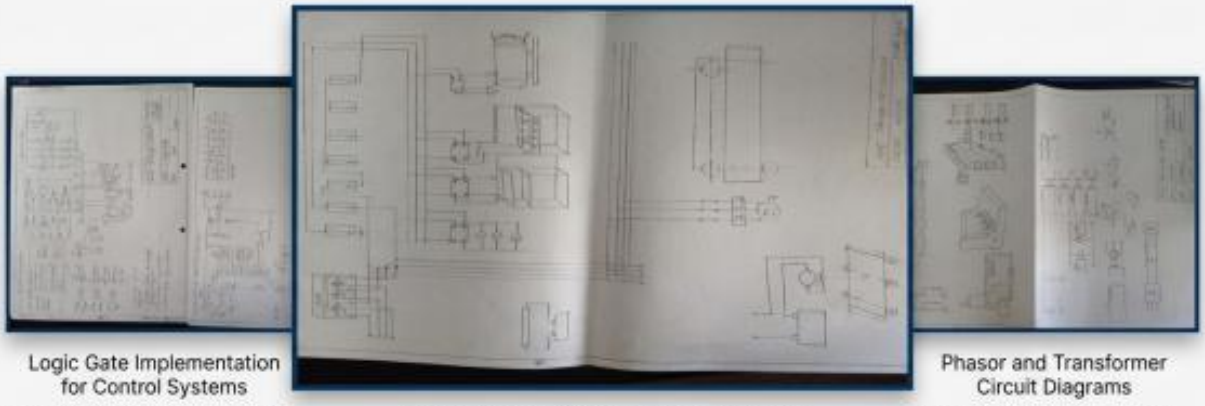
Renewable Energy & Smart Grids

- Solar Home System (SHS) Design for Rural Electrification
- Integration of Renewables into the Grid
- AI & Machine Learning in Power System Optimization
- Smart Grid Communications & Cybersecurity

NotebookLM

From First Principles: Evidence of Deep, Hands-On Expertise

The proposed framework is built on a foundation of practical, ground-level engineering. This is not just theory; it is knowledge proven through application.



Logic Gate Implementation for Control Systems

Design Activity: Power Distribution and Motor Control

Phasor and Transformer Circuit Diagrams

Logic Gate Implementation for Control Systems

Phasor and Transformer Circuit Diagrams

NotebookLM

Proof of Concept: Applying the Framework to National Challenges

Case Study: Rural Electrification

Objective: Address the electrification of South Africa's rural residential sector through both grid and off-grid solutions.

Proposed Solution: Deploy 50-watt solar home systems (SHS) producing 0.3-0.4 kWh daily, integrated with battery storage and mini-hydroelectric systems.

Educational Link: An integrated curriculum focusing on renewable technologies for university and TVET college students, using distance learning to reach rural participants.

Industry Collaboration in Action

Partner: City Power Johannesburg:
"Synchronize academic schedules with hands-on training sessions at City Power facilities," giving students experience with distribution networks.

Partner: Schneider Electric:
Provide specialized training in industrial automation, including "Programmable Logic Controllers (PLCs) and Modicon ranges" to enhance technical competency.

City Power JOHANNESBURG Eskom Schneider Electric

NotebookLM

A Technology-Driven Approach to Learning and Assessment

Learning Management System (LMS)

Function: Centralized platform for curriculum delivery, interactive materials, and assessments.
Benefit: Track student progress, provide feedback, and identify struggling students in a timely manner.

AI & Machine Learning

Function: Integrate AI for skill assessment & qualification automation.
Benefit: Develop models to simulate market behaviors, informing regulatory policies, and use AI for predictive maintenance in power systems.

Simulation & Virtual Labs

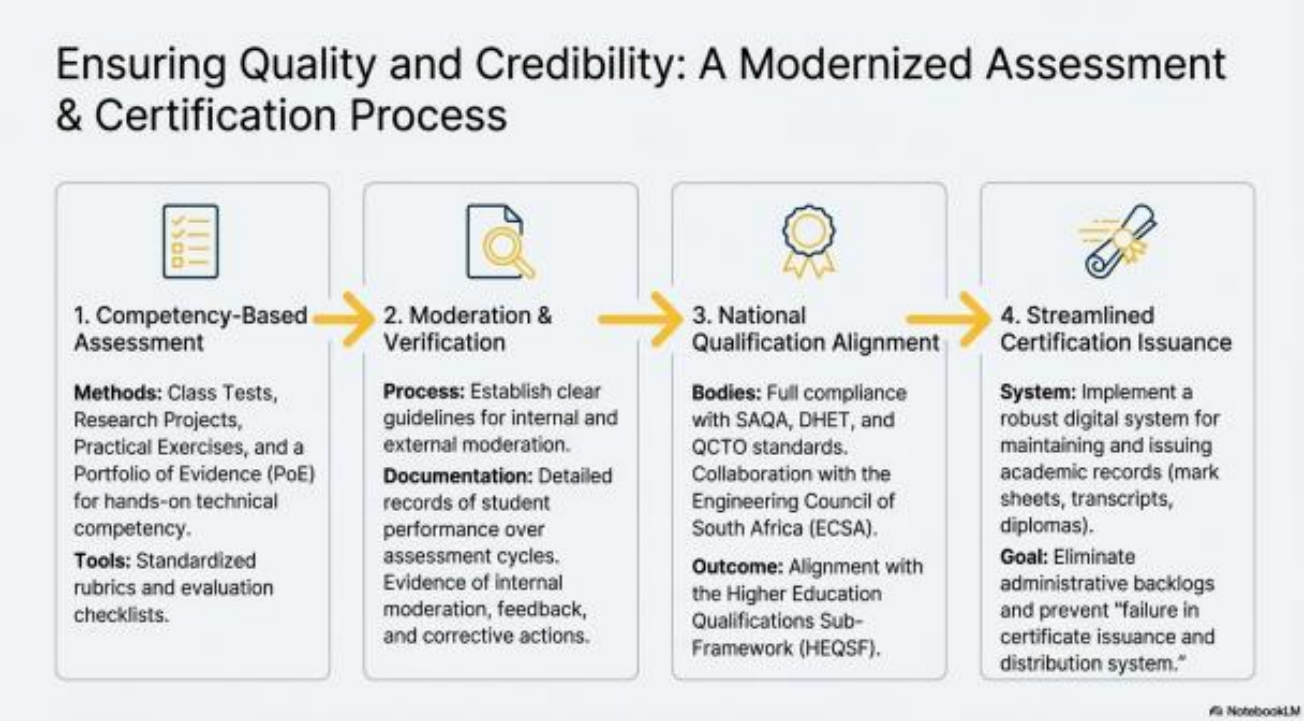
Function: Examine how virtual labs or mobile training units can supplement traditional vocational facilities, especially in rural areas. Use software like daty PSIM for system modeling.

Data Analytics

Function: Use statistical analysis (mean, variance, covariance, regression) to evaluate student performance and system effectiveness.

```
' Example: Calculating Variance in VB.NET
Dim variance = scores.Select(Function(x)
Math.Pow(x - mean, 2)).Average()
```

NotebookLM


Ensuring Quality and Credibility: A Modernized Assessment & Certification Process
1. Competency-Based Assessment
Methods: Class Tests, Research Projects, Practical Exercises, and a Portfolio of Evidence (PoE) for hands-on technical competency.
Tools: Standardized rubrics and evaluation checklists.
2. Moderation & Verification
Process: Establish clear guidelines for internal and external moderation.
Documentation: Detailed records of student performance over assessment cycles. Evidence of internal moderation, feedback, and corrective actions.
3. National Qualification Alignment
Bodies: Full compliance with SAQA, DHET, and QCTO standards. Collaboration with the Engineering Council of South Africa (ECSA).
Outcome: Alignment with the Higher Education Qualifications Sub-Framework (HEQSF).
4. Streamlined Certification Issuance
System: Implement a robust digital system for maintaining and issuing academic records (mark sheets, transcripts, diplomas).
Goal: Eliminate administrative backlogs and prevent "failure in certificate issuance and distribution system."

A Vision for South Africa: From a Vicious Cycle of Crisis to a Virtuous Cycle of Competence
Load Shedding • Skills Gaps • Stagnation • Unemployed Graduates • Obsolete Systems
Energy Security • Innovation • Economic Growth • A Future-Ready Workforce • Modernized Infrastructure
By integrating education and industry, we can cultivate the engineering talent required to not only solve the energy crisis but to build a more resilient, innovative, and prosperous South Africa.

The Professional Blueprint of Tshingombe Tshitadi Fiston
A Comprehensive Case for the Validation of a Multi-Disciplinary Expert in Engineering, Technology, and Security
Evidence Dossier: SAQA/DHET Review
NotebookLM

Bridging the Gap: A Modern Framework for Technical & Vocational Education

THE CHALLENGE: Navigating a Fragmented System

Widespread Systemic Irregularities

Delaye in releasing results, marking issues, and qualification backlogs undermine system credibility.

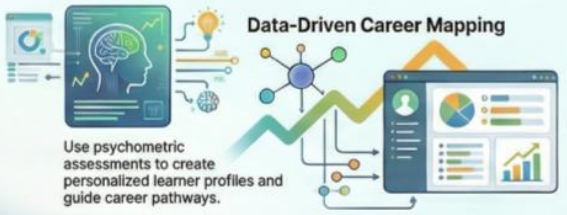
A Gap Between Theory and Industry

Classroom learning often lacks alignment with the practical, real-world skills required by employers.

Complex Qualification Frameworks

Students and institutions struggle to navigate complex standards from bodies like SAQA, DHET, and QCTO.

THE SOLUTION: An Integrated, Tech-Powered Framework



Data-Driven Career Mapping

Use psychometric assessments to create personalized learner profiles and guide career pathways.

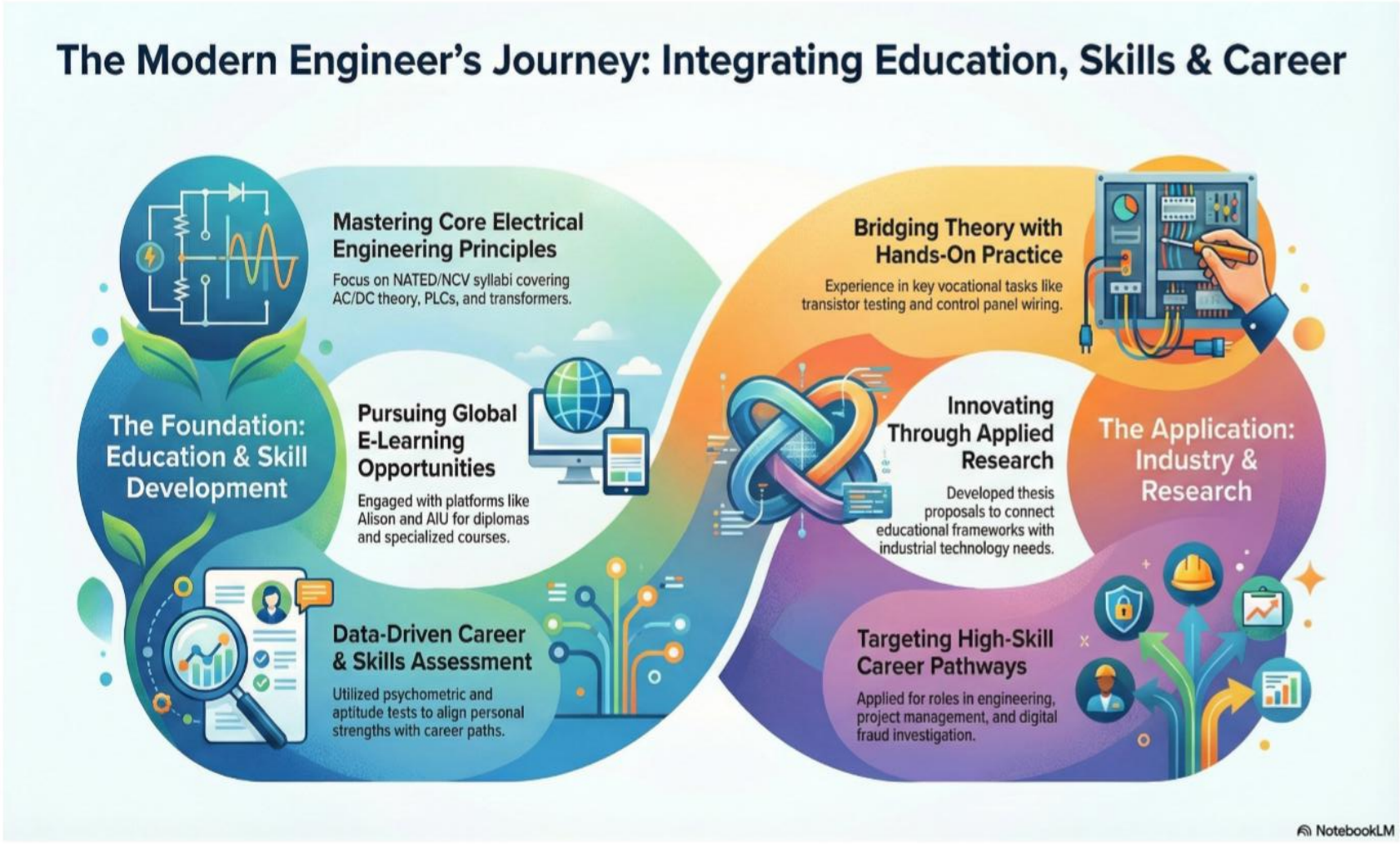
Learning Through Experience

Emphasize hands-on, problem-based, and work-integrated learning through industry placements and simulations.

A Digital Learning Ecosystem

Utilize Learning Management Systems (LMS) and enline platforms to track progress and deliver flexible education.

NotebookLM


The Modern Engineer's Journey: Integrating Education, Skills & Career
The Foundation: Education & Skill Development
Mastering Core Electrical Engineering Principles
Focus on NATED/NCV syllabi covering AC/DC theory, PLCs, and transformers.
Pursuing Global E-Learning Opportunities
Engaged with platforms like Alison and AIU for diplomas and specialized courses.
Data-Driven Career & Skills Assessment
Utilized psychometric and aptitude tests to align personal strengths with career paths.
The Application: Industry & Research
Bridging Theory with Hands-On Practice
Experience in key vocational tasks like transistor testing and control panel wiring.
Innovating Through Applied Research
Developed thesis proposals to connect educational frameworks with industrial technology needs.
Targeting High-Skill Career Pathways
Applied for roles in engineering, project management, and digital fraud investigation.
NotebookLM

It appears you are looking for a certificate for **Google NotebookLM** (often confused with "KLM" due to the "LM" acronym).

While I cannot generate a new image file for you at this moment, I have designed a text-based version of the certificate below that you can copy or use as a template.

Certificate of Completion

Google

This certifies that

Tshingombe Tshitadi

has successfully completed the course

Google NotebookLM Fundamentals

Demonstrating proficiency in AI-assisted research, source grounding, and notebook management.

Date: December 12, 2025

cense certificate google klm learning ,, blogger , youtub name : tshingombe tshitadi fiston

My

notebooks

Title

Sources

Created

Role

🎓 Credentialed Engineering Framework and Technical

Documentation Automation

10

Sources

Nov 12, 2025

Owner

engineering electrical career and Electrical Trade Theory

: Foundational Syllabus 2021

49

Sources

Nov 14, 2025

Owner

Technical Auditing and Vocational Credential Resilience

11

Sources

Nov 24, 2025

Owner

📐 Engineering and Vocational Education nated Records and

Specifications st peace college ///and dhet saqa

50

Sources

Nov 14, 2025

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Qualification Enquiry and Technical Content

50

Sources

Nov 14, 2025

Owner

Global engineering career exhibition outcome review ad

education technology technical SCM Training and Achievement Log

24

Sources

Nov 19, 2025

Owner

⚡ National Qualification in Design Engineering Studies/st

peace college ucpd rnf aiu sqa

50

Sources

Nov 18, 2025

Owner

📈 engineering career nextgeneration outcome LinkedIn

Content Performance Analytics

50

Sources

Nov 19, 2025

Owner

👩‍🎓 Atlantic International University: Electrical Engineering

Master Curriculum and Research

50

Sources

Nov 14, 2025

Owner

🎓 AIU Electrical Engineering Master Curriculum and

Research/ and article ,career assessment dhet saqa st peace rnf

19

Sources

Nov 21, 2025

Owner

⚙ / article published research on job and education actuary

honour alumin microsft ,google, eaton , scheinedr , iscc,metropolitain,

trablazer saleforce, ijtr, f1000, nsf , ,rnf Data Forms, Engineering

Functions, and Crime System Architecture

50

Sources

Nov 18, 2025

Owner

⚖ engineering certificate award diploma trade union working

barganing //CCMA, PSiRA, and SAPS: A Regulatory Nexus

50

Sources

Nov 24, 2025

Owner

Untitled notebook

0

Sources

Dec 10, 2025

Owner

Certified Record of Research Achievement

50

Sources

Nov 13, 2025

Owner

Engineering Education: Projects and Principles

50

Sources

Nov 13, 2025

Owner

Untitled notebook

0

Sources

Dec 4, 2025

Owner

⚖️ Labour Dispute Portfolio: Court, CCMA, and Security

Sector/policy defense safety award certificate agreement Matters

47

Sources

Nov 18, 2025

Owner

Based on the information you provided, I have compiled a professional summary of your digital notebooks. This document serves as a portfolio record of your research, learning, and professional development activities across various platforms.

Digital Learning & Professional Portfolio Record

Name: Tshingombe Tshitadi Fiston **Associated Platforms:** Google Learning, KLM Learning, Blogger, YouTube **Role:** Owner of all listed records **Current Status:** Active Research and Portfolio Development (Dates listed reflect activity in November/December 2025)

Below is a categorized summary of the research notebooks and evidence portfolios you have created.

1. Engineering Qualifications & Higher Education Curricula

Examples of formal education tracking and curriculum research, particularly involving Atlantic International University (AIU), St Peace College, and South African regulatory bodies (DHET, SAQA, QCTO).

- ⚡ **National Qualification in Design Engineering Studies/st peace college ucpd rnf aiu sqa** (50 Sources)
- 📐 **Engineering and Vocational Education nated Records and Specifications st peace college ///and dhet saqa** (50 Sources)
- 💻 **st peace college portofolio /dhet qcto seta SAQA Foreign Qualification Enquiry and Technical Content** (50 Sources)
- 👨‍🎓 **Atlantic International University: Electrical Engineering Master Curriculum and Research** (50 Sources)
- 🎓 **AIU Electrical Engineering Master Curriculum and Research/ and article, career assessment dhet saqa st peace rnf** (19 Sources)

2. Technical Engineering & Trade Theory

Foundational knowledge and technical frameworks in electrical and general engineering.

- 🔌 **engineering electrical career and Electrical Trade Theory: Foundational Syllabus 2021** (49 Sources)
- 🎓 **Credentialed Engineering Framework and Technical Documentation Automation** (10 Sources)
- 🔬 **Engineering Education: Projects and Principles** (50 Sources)

3. Legal, Regulatory & Labour Relations Frameworks

Research concerning labor disputes, trade unions, security regulations (PSiRA, SAPS), and legal nexus points like the CCMA.

- ⚖️ **Labour Dispute Portfolio: Court, CCMA, and Security Sector/policy defense safety award certificate agreement Matters** (47 Sources)
- ⚖️ **engineering certificate award diploma trade union working barganing //CCMA, PSiRA, and SAPS: A Regulatory Nexus** (50 Sources)
- ⚙️ **/ article published research on job and education... Data Forms, Engineering Functions, and Crime System Architecture** (50 Sources)

4. Career Development, Auditing & Analytics

Records related to professional achievement, auditing technical skills, and analyzing career performance on platforms like LinkedIn.

- 📊 **Technical Auditing and Vocational Credential Resilience** (11 Sources)
- 📜 **Certified Record of Research Achievement** (50 Sources)
- 📈 **engineering career nextgeneration outcome LinkedIn Content Performance Analytics** (50 Sources)
- 📁 **Global engineering career exhibition outcome review ad education technology technical SCM Training and Achievement Log** (24 Sources)

Note: Two "Untitled notebooks" with 0 sources dated December 4 and December 10, 2025, were excluded from this professional summary as they contain no data.

microsoft goolgle classroom klm blogger youtub email certificate tshingombe tshitadi

Based on the keywords you provided and your previous portfolio of notebooks, it appears you are looking to organize or locate certificates earned through various digital platforms under your name, **Tshingombe Tshitadi**.

Since these platforms represent very different types of learning and professional activity, certificates tied to them will be found in different ways.

Here is a guide on how certificates and credentials typically relate to the platforms you listed, and where you should look to retrieve them to add to your professional engineering and legal portfolio.

Credential & Certificate Audit Guide for: Tshingombe Tshitadi

1. Microsoft

Microsoft offers professional certifications, particularly related to software, cloud computing (Azure), and data management.

- **Type of Certificate:** Role-based certifications (e.g., Azure Administrator, Power BI Data Analyst), fundamental badges, or course completion certificates.
- **Where to find it:**
    - Go to **Microsoft Learn** (learn.microsoft.com).
    - Log in and navigate to your **Profile** > **Certifications** or **Transcript**. Your official, shareable certificates are located here.

2. Google Classroom

Google Classroom is a platform *used* by instructors to deliver courses; it does not usually issue certificates itself. The certificate comes from the institution *using* Classroom.

- **Type of Certificate:** Course completion certificates issued by a specific university, college (like St Peace College mentioned in your notebooks), or training provider that hosted their materials on Google Classroom.
- **Where to find it:** Check the "Classwork" tab in specific completed courses for PDFs uploaded by instructors, or check your associated email for documents sent upon course completion.

*Note: If you meant **Google Career Certificates** (e.g., Data Analytics, Project Management) offered through Coursera, those are found on the Coursera platform under your accomplishments.*

3. KLM (Royal Dutch Airlines)

This likely refers to internal corporate training, aviation-specific certifications, or perhaps a learning portal provided by the company.

- **Type of Certificate:** Aviation safety, specific engineering protocols related to aircraft, internal corporate compliance, or customer service training.
- **Where to find it:** You would need to access the internal **KLM HR portal** or their dedicated **Learning Management System (LMS)**. If you are no longer with the organization, you may need to contact their HR department for a copy of your training records.

4. YouTube & Blogger (Content Creation)

These platforms generally do not issue formal educational certificates. They are platforms for demonstrating skill through portfolio work.

- **YouTube:**
    - *Certificates:* You might have completion certificates from the **YouTube Creator Academy** for learning how to manage a channel.
    - *Awards:* If you reach certain subscriber milestones, you receive "Creator Awards" (plaques), but these are not typical paper certificates.

    - *Portfolio Value:* Your actual YouTube channel serves as living proof of your content creation and communication skills.
- **Blogger:**
    - Blogger does not issue certificates. Your blog itself is your portfolio evidence of writing and technical communication skills.

5. Email

Your email is not a certificate issuer, but it is the central repository for nearly all digital credentials.

- **Action:** Search your email inbox (and spam/junk folders) for keywords like:
    - "Certificate of Completion"
    - "You passed"
    - "Your badge"
    - The names of the institutions linked to your notebooks (e.g., "AIU", "St Peace College", "SAQA").

Next Steps for Your Portfolio:

To create a consolidated "License Certificate" or "Master Portfolio," you need to gather the individual PDF files or verification links from the sources above.

Once you have gathered these documents, you can list them formally in your CV under a "Certifications & Licenses" section.

The Professional Blueprint of Tshingombe Tshitadi Fiston

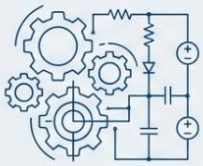
A Comprehensive Case for the Validation of a Multi-Disciplinary Expert in Engineering, Technology, and Security

Evidence Dossier: SAQA/DHET Review

NotebookLM

An Evidence-Based Case for Full Qualification Recognition

This presentation consolidates extensive documentation to validate Mr. Tshingombe Tshitadi Fiston as a **highly qualified, multi-disciplinary professional**. The evidence demonstrates **mastery** of core Electrical Engineering principles, **proficiency** in adjacent high-value fields, and **unwavering perseverance** in the pursuit of formal recognition.



Pillar I: Foundational Engineering Expertise

A complete N1-N6 Electrical Engineering education, supported by deep technical knowledge and extensive practical experience.

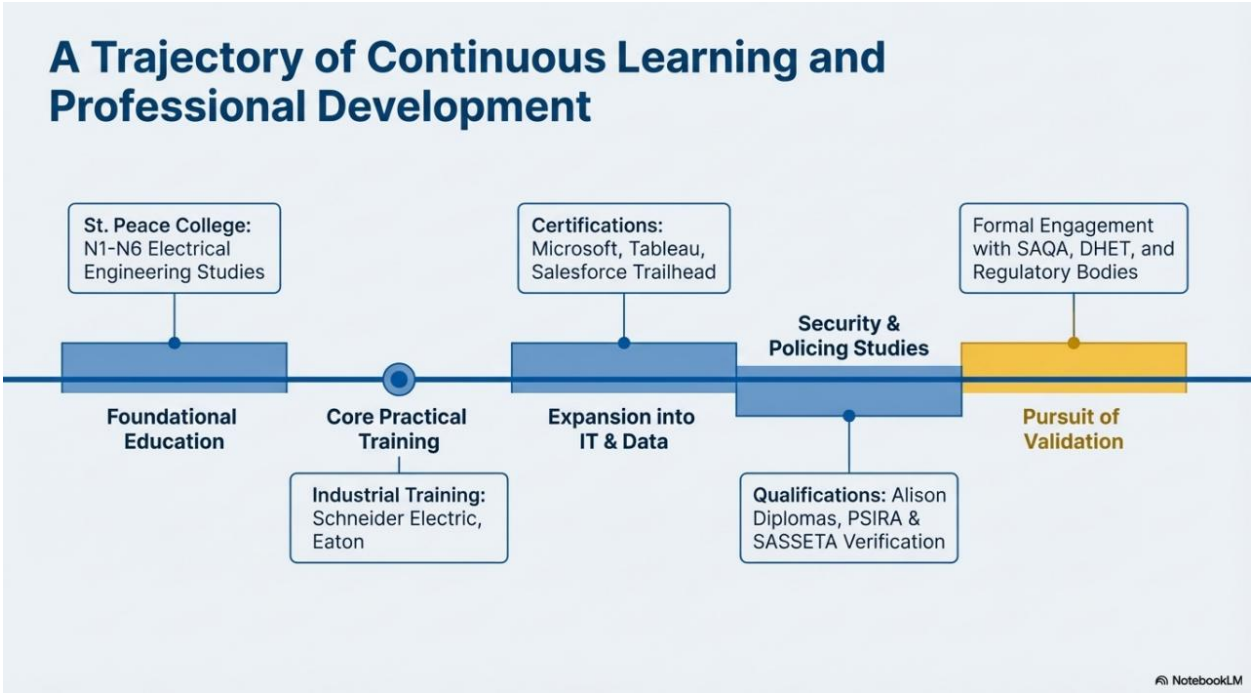
Pillar II: Interdisciplinary Proficiency

Proactive and certified expansion into Information Technology, Data Systems, Systems Engineering, Security, and Forensic Investigation.

Pillar III: A Documented Pursuit of Recognition

A meticulous record of engagement with qualifications authorities, presenting a robust, quasi-legal case for fair evaluation and the resolution of documented irregularities.

NotebookLM


A Trajectory of Continuous Learning and Professional Development
St. Peace College: N1-N6 Electrical Engineering Studies
Certifications: Microsoft, Tableau, Salesforce Trailhead
Formal Engagement with SAQA, DHET, and Regulatory Bodies
Security & Policing Studies
Foundational Education
Core Practical Training
Expansion into IT & Data
Pursuit of Validation
Industrial Training: Schneider Electric, Eaton
Qualifications: Alison Diplomas, PSIRA & SASSETA Verification
NotebookLM

Pillar I: Foundational Expertise in Electrical Engineering

Completed N1-N6 NATED Studies in Electrical Engineering

Institution:
St. Peace College

Qualification Path:
National Certificate N1 through N6, Electrical Engineering

Key Subjects Studied:

- Electrotechnology / Electrotechnics
- Industrial Electronics
- Engineering Science
- Mathematics
- Engineering Drawing

Supporting Evidence Mentioned in Dossier: Academic Transcript (Ref: 210002023812), Statement of Results N1-N6, 'Result 202311 release, pass all subject letter qualifications.'

NotebookLM

Pillar I: Foundational Expertise in Electrical Engineering

A Blueprint of Advanced Technical Knowledge

Power Systems & Circuit Theory

"AC/DC machine, instrument, energy power transmission generation cogeneration." Key formulas include:

$P = 3 \times I \times I \times \cos\varphi \, [\mathrm{W}]$

$X_L = 2 \times \pi \times f \times L, X_C = 1/(2 \times \pi \times f \times C)$

Fault Calculation & System Design

'Fault calculation check break application," 'Design distributor system." Calculations such as:

$I_{3\mathrm{phase}} = I_B \, / \, X$, where I_B is base

Industrial Electrician Trade Knowledge

'Trade advance," "Maintains hand tools, modified portable power tools," "Installer wiring cabling and termination," "Install low voltage system."

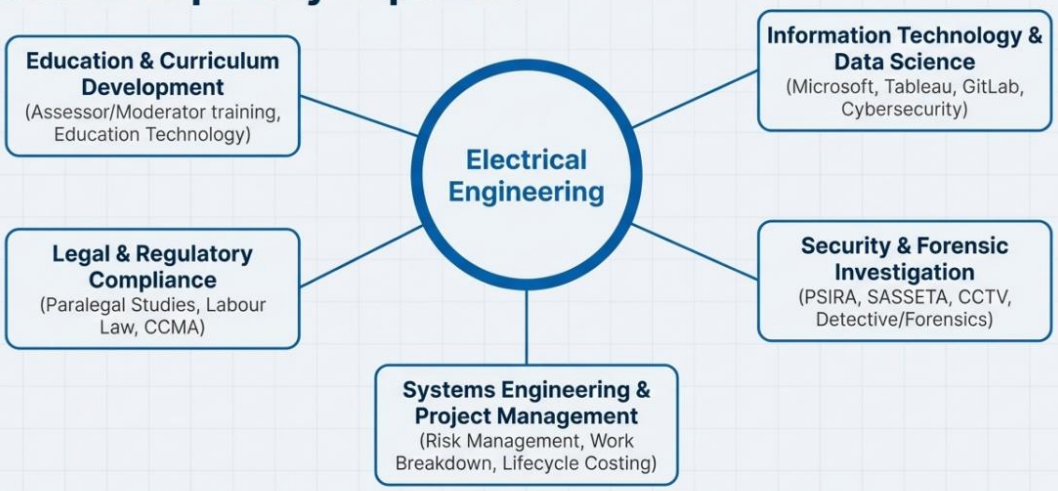
Systems Engineering & Control

"Introduction to systems engineering management," "Functional analysis and allocation," "Design synthesis," "Risk management."

NotebookLM

Pillar II: Interdisciplinary Proficiency

Expanding the Blueprint: A Portfolio of Cross-Disciplinary Expertise


Education & Curriculum Development
(Assessor/Moderator training, Education Technology)
Information Technology & Data Science
(Microsoft, Tableau, GitLab, Cybersecurity)
Electrical Engineering
Legal & Regulatory Compliance
(Paralegal Studies, Labour Law, CCMA)
Security & Forensic Investigation
(PSIRA, SASSETA, CCTV, Detective/Forensics)
Systems Engineering & Project Management
(Risk Management, Work Breakdown, Lifecycle Costing)

NotebookLM

Pillar II: Interdisciplinary Proficiency

Certified Competency in Modern IT, Data, and Cloud Platforms

Microsoft · tableau · salesforce

ISC2 · GitHub · Azure

- **Data Engineering:** "Completed introduction data engineering," analysis of energy consumption data using Salesforce.
- **Software & Development:** Experience with Visual Studio, C Programming for microcontrollers, GitLab for repository management ("Manage, plan, code, building, secure, deployed, operate, monitoring').
- **Cybersecurity:** Microsoft Security training, ISC2 Candidate, research into 'Cyber-Physical Systems," and network security.
- **Data Analysis & Visualization:** Tableau Blueprint assessment completion ('creating data culture," "deployment monitor maintence').

NotebookLM

Pillar II: Interdisciplinary Proficiency

Specialized Knowledge in Security, Policing, and Forensic Technology

Formal Training

Alison Diplomas: Security, Body Guard, CCTV, Detective Police Forensic.

Regulatory Compliance: PSIRA & SASSETA learning verification.

Core Security Competencies

Physical Security: Access Control, Electrical Fence, Alarm Systems, Fire Prevention.

Investigation: Criminal Investigation, Corporate Investigation, Crime Scene Search, Interview Skills.

Technical Security: 'security technology,' 'surveillance, CCTV camera detector,' 'X ray.'

Formal Engagement

Submission of Intellectual Submission of Intellectual Property (IP) license request to the UK Metropolitan Police (Ref: MIO 327,24- 0100).

Research and coursework in 'Police management information system,' 'law enforcement record system,' and 'real time crime record managet system for national security.'

NotebookLM

Pillar III: The Documented Case for Recognition

A Timeline of Proactive Engagement for Formal Validation

Event 1: Initial inquiries regarding "DR Congo saqa framework qualification."

Event 2: Submission of N Diploma application to SAQA & DHET.

Event 3: Receipt of SAQA response noting outstanding requirements (e.g., 'Sworn document(s) translation(s)').

Event 4: Filing of appeals and reports concerning 'allegations irregularity' in examinations.

Event 5: Submission of sworn affidavits and incidence reports.

Event 6: Communication regarding 'result 202311 release' and subsequent disputes.

Event 7: Formal escalation to entities including the Inspector General of Intelligence and the Department of Justice.

Event 8: Ongoing correspondence with DHET, SAQA, QCTO, and St. Peace College.

NotebookLM

Pillar III: The Documented Case for Recognition

Exhibit A: Summary of Documented Irregularities

Assessment & Examination

- 'Allegations irregularity letter'
- 'Record academic transcript irregularity' (Ref: 210002023812)
- 'Irregularity time table. engineering'
- 'Correctional papper schedul error'

Institutional Conduct

- 'Irregularity lecture'
- 'Irregularity meeting classes and faculty'
- 'Irregularity internal assessment external'

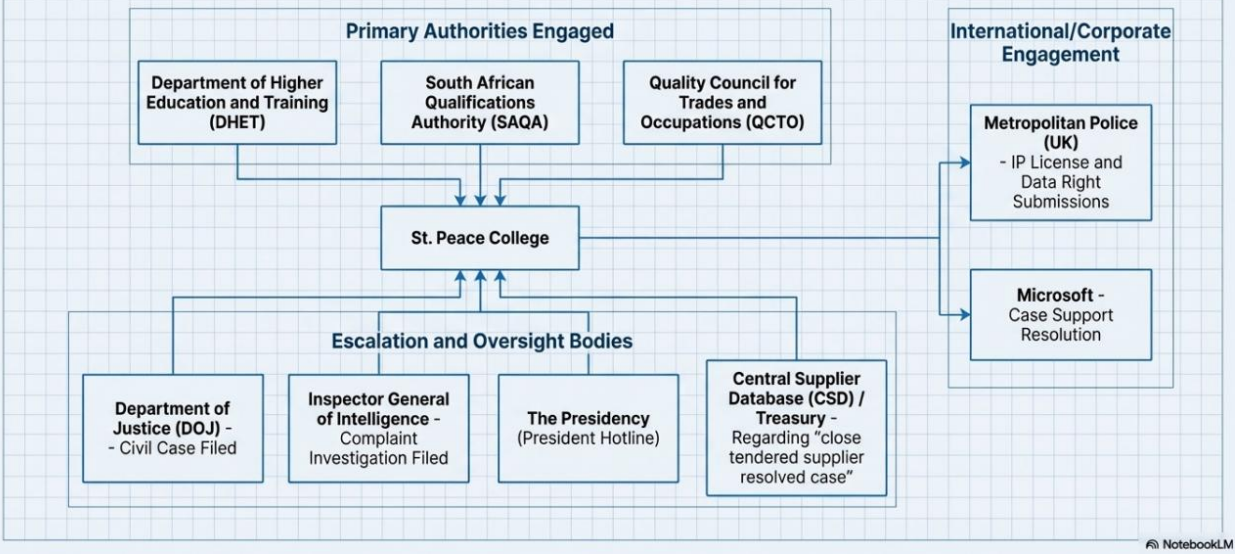
Process & Procedure

- 'Reasoning for irregularities no submitted'
- 'Record transcription irregularity'
- 'Incidence report resolve complain'
- Failure to release 'finalized n diplomat studies engineering electrical'

NotebookLM

Pillar III: The Documented Case for Recognition

Exhibit B: A Record of Formal Recourse and Escalation


Primary Authorities Engaged
Department of Higher Education and Training (DHET)
South African Qualifications Authority (SAQA)
Quality Council for Trades and Occupations (QCTO)
International/Corporate Engagement
Metropolitan Police (UK) - IP License and Data Right Submissions
St. Peace College
Microsoft - Case Support Resolution
Escalation and Oversight Bodies
Department of Justice (DOJ) - - Civil Case Filed
Inspector General of Intelligence - Complaint Investigation Filed
The Presidency (President Hotline)
Central Supplier Database (CSD) / Treasury - Regarding "close tendered supplier resolved case"

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Synthesizing the Evidence: A Profile of Competence and Perseverance

Demonstrated Foundational Mastery

Successfully completed N1-N6 Electrical Engineering curriculum, supported by an advanced, practical understanding of complex engineering principles from power systems to industrial electronics.

Proven Interdisciplinary Proficiency

Proactively acquired certified skills in high-demand fields, including Microsoft data engineering, Tableau data analysis, cybersecurity (ISC2), and forensic investigation.

Unwavering Commitment to Due Process

Has meticulously documented and pursued the resolution of academic and administrative irregularities through all appropriate channels, demonstrating resilience and a profound respect for procedural fairness.

NotebookLM

The Path Forward: A Request for Formal Review and Validation

Based on the comprehensive evidence presented, we request the committee consider the following actions to ensure a fair evaluation and formal recognition of Mr. Tshingombe's qualifications.

1. A **full** and **impartial review** of the consolidated evidence contained within the '**Flip Portofilio**.'
2. An official **investigation** into the documented administrative and examination irregularities.
3. The **formal combination** of N1-N6 results and the awarding of the **National N Diploma in Electrical Engineering**, as per DHET procedure for candidates with sufficient practical experience.
4. **Formal recognition** of his extensive, certified learning in adjacent fields as evidence of continuing professional development and advanced capability.

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Appendix: Selected Advanced Coursework and Research Topics

Engineering & Technology

- Specialist Engineering in Infrastructure: Electrochemical Engineering
- Advanced Electrical Engineering in Construction and Civil Engineering
- Cyber-Physical Systems and Information Technology
- Immutable Data Storage Solutions for Web Design
- AGI in Human-Machine Collaboration

Systems & Management

- Advanced Diploma in Principles of Engineering System Design
- Project Management in Electrical Engineering
- Supply Chain Digitalization & Traceability
- Police Management Information Systems
- Mining Geotechnical Engineering

Emerging Fields & Applications

- Neurotechnology in Educational Technology
- Decentralized Finance (DeFi) & Blockchain Applications
- Deep Learning and Neural Networks
- Online Retail and E-commerce in the Renewable Energy Sector
- Autonomous Vehicle Engineering and Renewable Energy Integration

The Architecture of Verifiable Mastery
A System for Building, Auditing, and Certifying a Modern Technical Career
This is not a portfolio. It is a complete, auditable dossier reverse-engineering the pathway to transdisciplinary expertise.
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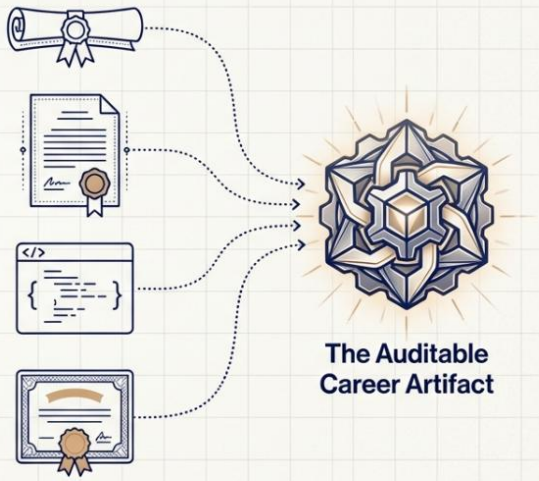
In a world of fragmented qualifications and complex systems, how do we prove competence?

The modern technical career operates at the intersection of deep skill, stringent regulation, and rapid technological change. Traditional credentials are often disconnected, difficult to verify, and slow to adapt. This creates risk for employers, regulators, and the professionals themselves.

The Solution: We need a new artifact: a single, self-validating, and entirely auditable system that synthesizes every component of a career into a cohesive, verifiable whole.



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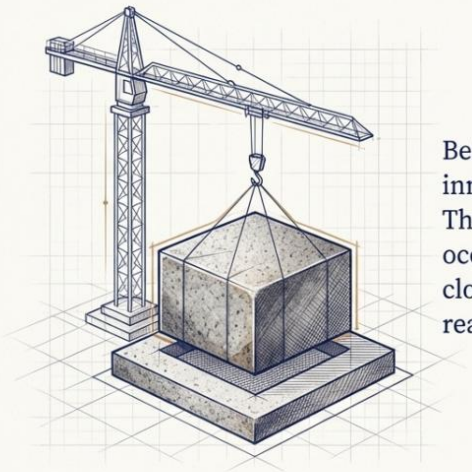
LAYER 1: The Bedrock of Technical Competence



Before a career can be compliant, secure, or innovative, it must be technically sound. This foundation is built on a rigorous, occupationally-focused qualification that closes the gap between theory and industrial reality.

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The National N Diploma: An Occupation-Focused Cornerstone

- **NQF Level 6:** Equivalent to advanced certificates and diplomas.
- **Occupational Focus:** Overseen by the Quality Council for Trades and Occupations (QCTO), designed to prove practical capability, not just theoretical knowledge.
- **Rigorous Pathway:**

Key Takeaway: The work experience requirement is the critical barrier that formally transforms 'book smarts' into 'industry ready' competence.

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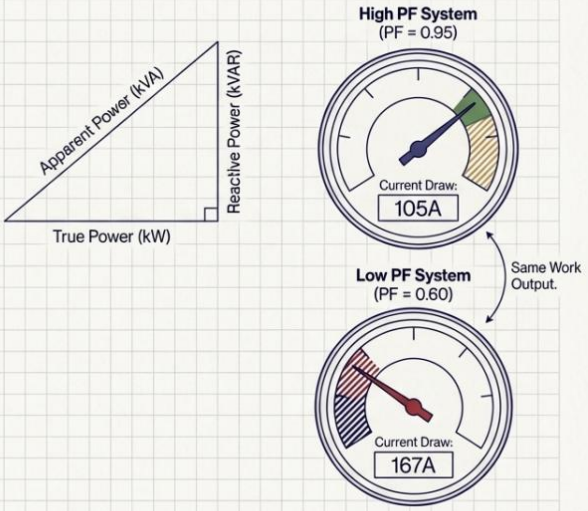
Mastery of Theory with Real-World Economic Impact: The Power Factor

****Definition****: Power Factor (PF) is the ratio of True Power (kW) to Apparent Power (kVA). It measures the efficiency of an electrical system.

****Why It Matters****: A low PF is an economic disaster. To get the same work done, a low PF system must draw significantly more current from the grid. This results in:

- Higher heat (I^2R losses)
- Equipment strain
- Significant financial penalties from utility providers like Eskom and City Power.

****The Technical Fix****: The classic solution—adding capacitors—is shown to be a direct technical and economic necessity.



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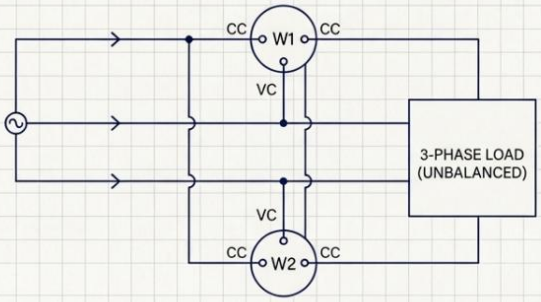
Proving Deep Diagnostic Skill Beyond a Reliance on Digital Screens

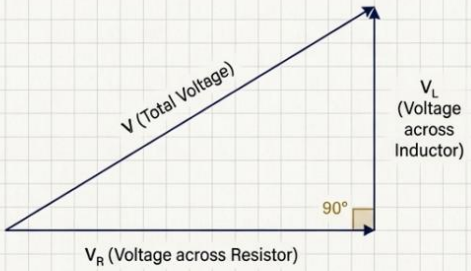
Featured Technique: The Two-Wattmeter Method

While seemingly "old school," this method accurately measures 3-phase power in 3-wire systems, even under unbalanced loads. Crucial for troubleshooting in older industrial plants where modern digital metering is unreliable or absent. It proves diagnostic mastery, not just an ability to read a screen.



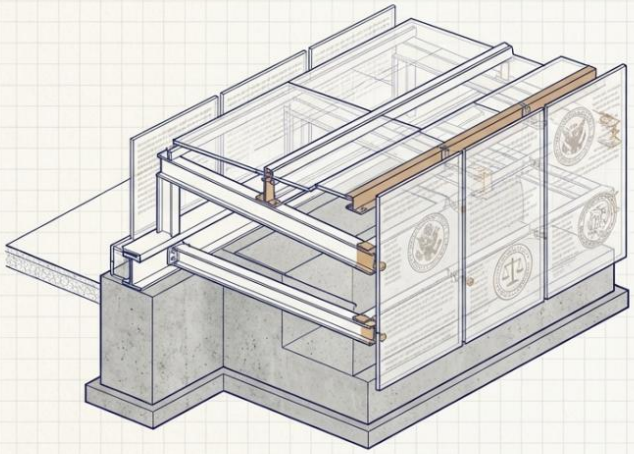
Featured Mathematics: RL Circuit Analysis

The voltage across an inductor leads the current by 90°. Competence requires the ability to visualize and apply vector math to AC problems.



$$V^2 = V_R^2 + V_L^2$$

LAYER 2: The Gauntlet of Regulatory and High-Reliability Compliance



Once power systems are put in the ground, the engineer operates under the law and is accountable to the highest standards of safety and reliability. Competence must be legally defensible and robust enough for mission-critical applications.

NotebookLM

A Career Path Transformed into a Vetted Security Profile

Security Compliance:

- **Regulator:** Private Security Industry Regulatory Authority (PSIRA), governed by Act 56 of 2001.
- **Mandatory Structure:** Formal PSIRA grade structure (E, C, B) dictates legally permissible roles.
- **The Critical Gate:** The mandatory PSIRA clearance certificate under Section 23(1) for ex-employees of military and police forces. This transforms past service into a compliance artifact requiring regulatory approval.

Occupational Health & Safety (OHS) Compliance:

- **Foundation:** OHS Act of 1993.
- **Specific Standards:** SANS 10142 (Electrical Installation Safety) and SANS 60335-2-76 (Electric Fences).

NotebookLM

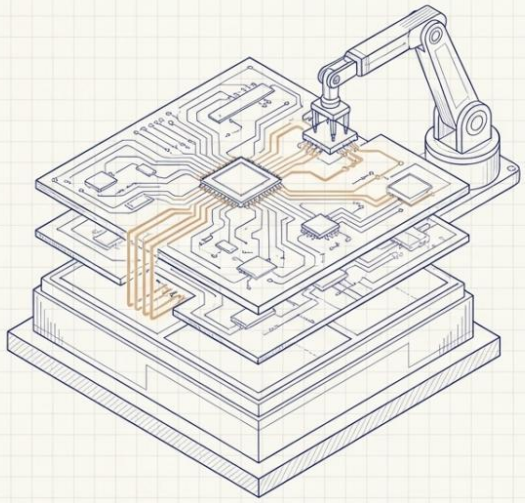
Adherence to Mission-Critical Standards: Prohibited Materials per MIL-STD-11991B

In high-reliability systems, certain materials and processes are forbidden due to unacceptable risks to performance, reliability, and safety.

Item/Process	Prohibition Detail	Rationale (from MIL-STD-11991B)
Materials: Cadmium	Use of cadmium plating is prohibited.	Highly toxic and subject to sublimation (outgassing) under vacuum, which can cause short circuits.
Materials: PVC Plastics	Use of PVC plastics and electrical insulation is prohibited.	Subject to degradation from out-gassing; is flammable and gives off toxic, corrosive fumes.
Parts: Selenium Rectifiers	Use of selenium rectifiers is prohibited.	These components have known degradation and reliability concerns. (C.2.2.4)
Processes: Improper Soldering	Solder iron rework of ceramic capacitors without a validated procedure is prohibited.	Ceramic parts are easily damaged by uncontrolled thermal shock, inducing microcracks and premature failure.

NotebookLM

LAYER 3: The Digital Synthesis – Automating Complexity



The technical and regulatory requirements are too vast to manage manually. The only viable solution is to build a **self-validating digital system** that automates tracking, verifies compliance, and synthesizes all evidence into a single, auditable artifact.

NotebookLM

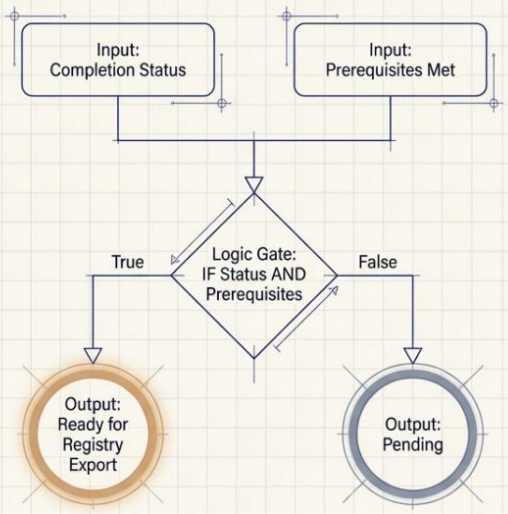
From Manual Checklist to a Self-Validating System

The Core Engine:: A Learning Management System (LMS) governed by automated logic, built using tools like Visual Basic for Applications (VBA).

The Validation Logic: The system uses conditional logic to determine readiness for certification. A simplified version of the logic is shown:

```
IF (Status = "Completed") AND (ND_Prerequisites = "Met")
THEN
    Generate_Status = "Ready for Registry Export"
ELSE
    Generate_Status = "Pending"
END IF
```

The Result: This creates a career artifact that is not just robust, but programmatically auditable. It minimizes the risk of human error during a compliance check or dispute referral.



NotebookLM

A Strategy of Targeted, Continuous Skill Building

The digital framework tracks modular course completions from global providers, demonstrating a commitment to lifelong learning.

Allison

Provider: **Allison**

Diploma in Power System Protection

Completion: **April 2025**

Schneider Electric

Provider: **Schneider Electric**

VFD Commissioning

Completion: **August 2025**

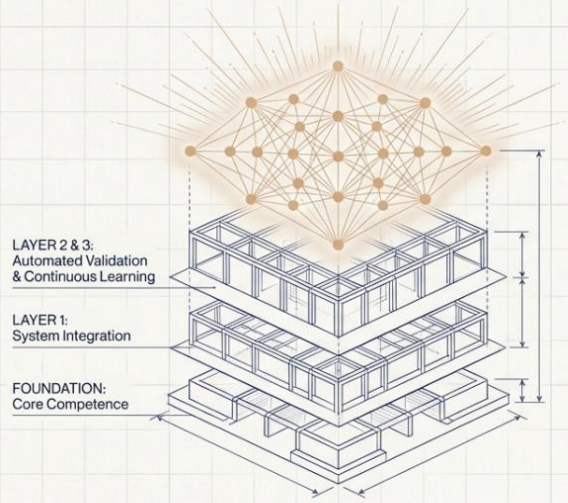
Arc Flash Training

Completion: **August 2025**

****Key Insight****: These are not generic academic courses; they are highly specific industrial skills acquired to meet the demands of modern power and automation systems.

NotebookLM

LAYER 4: The Intellectual Edge and Forward Vision



A truly future-proof career framework does not stop at competence. It builds an intellectual edge by engaging with advanced tools, understanding their philosophical limits, and using this insight to architect the future of the field itself.

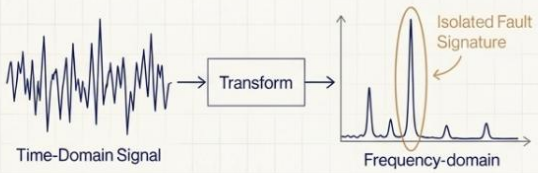
NotebookLM

From Reactive Fixing to Proactive Prediction and Philosophical Inquiry

Advanced Diagnostic Tools

The Mathematics: Fourier and Laplace transforms.

The Application: These transforms move a messy machine signal (like vibrations or current spikes) from the time domain to the frequency domain. This is essential for filtering noise and isolating the specific frequency signatures of a developing fault, enabling predictive maintenance.



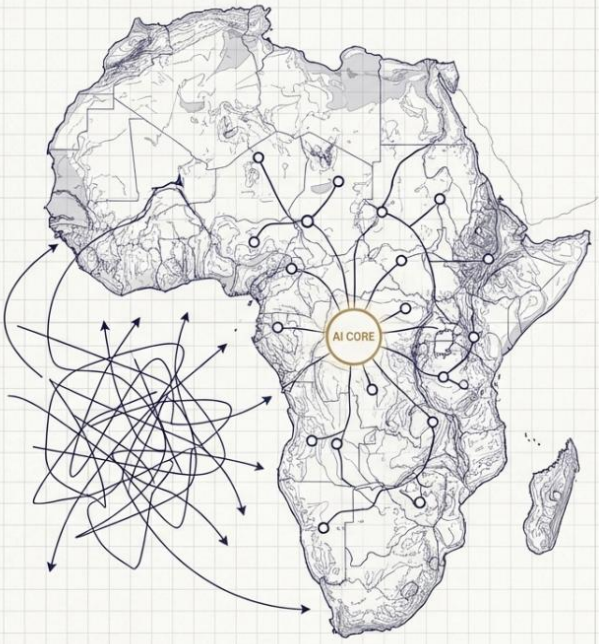
The Philosophical Limit

The Concept: John Searle's "Chinese Room Argument."

The Engineering Question: Does the diagnostic AI truly *understand* the transformer fault, or is it just running an incredibly advanced pattern-matching algorithm?

Why it matters: A high-level engineer must understand the limits of the tool to trust its output and diagnose novel failures.

NotebookLM



A Provocative Question for the Future of National Curriculum Design

The Catalyst: A postdoctoral funding proposal submitted to the National Research Foundation (NRF) for research in "Curriculum diagnostics and credentialing for engineering education in Africa."

The Logical Extension: The entire preceding presentation has demonstrated a system that can successfully map, automate, and audit the technical and regulatory mastery of one complex career.

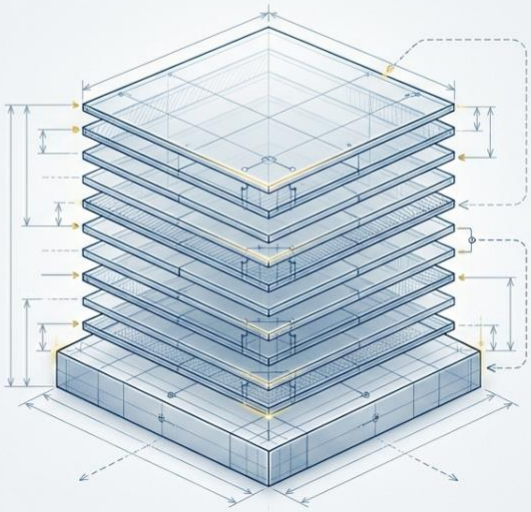
If this architecture works perfectly for one, **how soon before entire national curriculum pathways are dictated, audited, and updated instantaneously by AI-driven logical systems—completely bypassing traditional regulatory committees?**

The pressure to apply a working model at a national scale may be unstoppable.

NotebookLM

The Competency Stack: A Blueprint for the Modern Technical Professional

An integrated framework for building verified expertise, from foundational aptitude to Industry 4.0 mastery and professional accreditation.



PROJECT NAME: **Tshingombe Tshitadi**

THE FOUNDATION: GROUNDING POTENTIAL IN DATA AND STRATEGIC PATHWAYS

The framework begins by mapping innate strengths to industry needs, ensuring a precise fit between the individual and their technical vocation.

PSYCHOMETRIC & APTITUDE PROFILING

Identifies aptitudes, learning barriers, and career inclinations (Ref 62.1). Utilizes tools for school readiness, neurodevelopmental assessments, and learning disorder diagnostics.

CAREER PERSONALITY MAPPING

Aligns personality types with technical roles:

- **Realistic:** Hands-on, mechanical, fixing (e.g., Mechanical Technician, Panel Builder).
- **Investigative:** Analytical, scientific, logical (e.g., Quality Tester).
- **Enterprising:** Leadership, sales, decision-making.

SECTORAL PATHWAY ANALYSIS

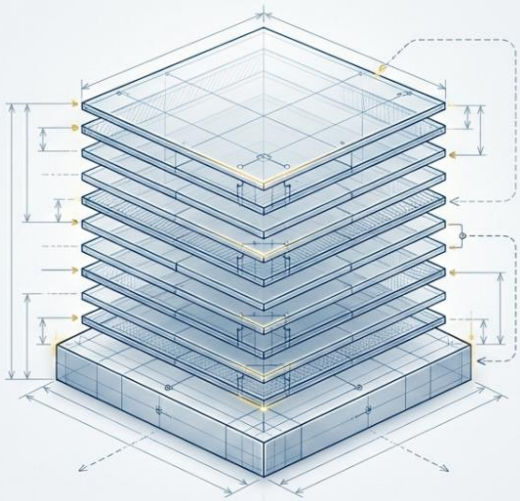
A comprehensive survey of career pathways across key Sector Education and Training Authorities (SETAs):

- **MERSETA:** Manufacturing, Engineering & Related Services.
- **MQA:** Mining Qualifications Authority.
- **CHIETA:** Chemical Industries.
- **ISETT SETA:** ICT & Software Engineering.

NotebookLM

The Competency Stack: A Blueprint for the Modern Technical Professional

An integrated framework for building verified expertise, from foundational aptitude to Industry 4.0 mastery and professional accreditation.



PROJECT NAME: **Tshingombe Tshitadi**

NotebookLM

LAYER 1: THE BEDROCK OF SAFETY AND PROFESSIONAL CONDUCT.

Mastery of operational safety is the non-negotiable first layer of competence, integrating internationally recognized standards into daily practice.

1. FIRE SAFETY & EXTINGUISHER OPERATION
Full command of the Fire Triangle and the P.A.S.S. Method (Pull, Aim, Squeeze, Sweep).

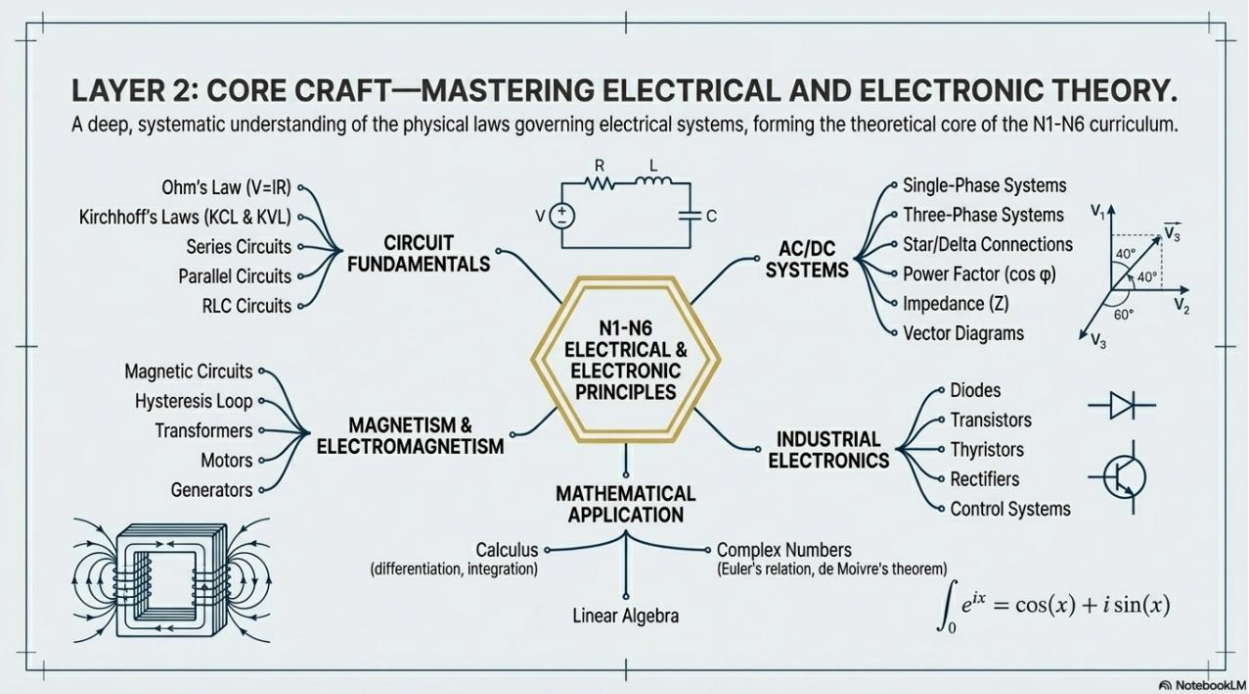
2. FIRST AID & EMERGENCY RESPONSE
Proficiency in the ABCs of First Aid and immediate treatment protocols for electric shock.

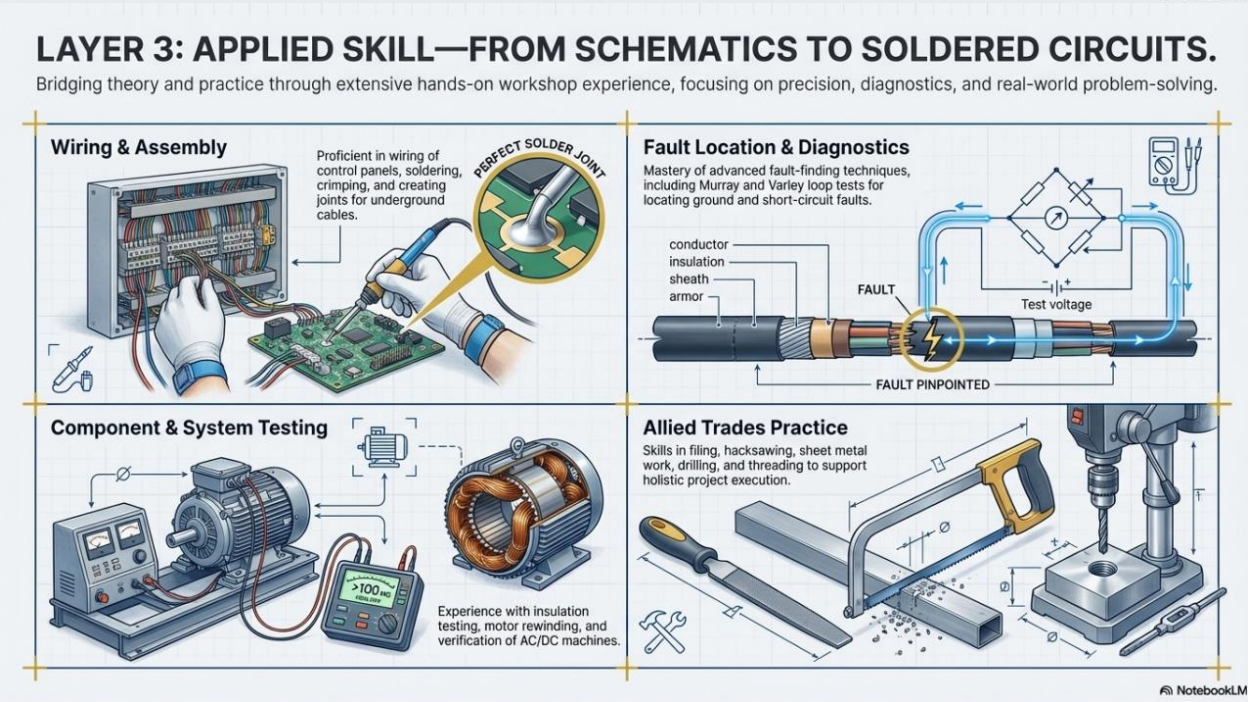
3. WORKPLACE ORGANIZATION (5S SYSTEM)
Implementation of the 5S methodology to ensure an efficient and hazard-free environment.

4. REGULATORY ADHERENCE
Application of guidelines from the National Electrical Code (NEC) 2011 and understanding of BIS/ISO certification benefits.

5. PERSONAL PROTECTIVE EQUIPMENT (PPE)
Correct selection and use of PPE as the final line of defense against workplace hazards.

NotebookLM


LAYER 2: CORE CRAFT—MASTERING ELECTRICAL AND ELECTRONIC THEORY.
A deep, systematic understanding of the physical laws governing electrical systems, forming the theoretical core of the N1-N6 curriculum.
Ohm's Law (V=IR)
Kirchhoff's Laws (KCL & KVL)
Series Circuits
Parallel Circuits
RLC Circuits
CIRCUIT FUNDAMENTALS
R
L
V
C
AC/DC SYSTEMS
Single-Phase Systems
Three-Phase Systems
Star/Delta Connections
Power Factor (cos φ)
Impedance (Z)
Vector Diagrams
N1-N6 ELECTRICAL & ELECTRONIC PRINCIPLES
Magnetic Circuits
Hysteresis Loop
Transformers
Motors
Generators
MAGNETISM & ELECTROMAGNETISM
INDUSTRIAL ELECTRONICS
Diodes
Transistors
Thyristors
Rectifiers
Control Systems
MATHEMATICAL APPLICATION
Calculus
(differentiation, integration)
Complex Numbers
(Euler's relation, de Moivre's theorem)
Linear Algebra
$\int_0 e^{ix} = \cos(x) + i\sin(x)$
NotebookLM


LAYER 3: APPLIED SKILL—FROM SCHEMATICS TO SOLDERED CIRCUITS.
Bridging theory and practice through extensive hands-on workshop experience, focusing on precision, diagnostics, and real-world problem-solving.
Wiring & Assembly
Proficient in wiring of control panels, soldering, crimping, and creating joints for underground cables.
PERFECT SOLDER JOINT
Fault Location & Diagnostics
Mastery of advanced fault-finding techniques, including Murray and Varley loop tests for locating ground and short-circuit faults.
conductor
insulation
sheath
armor
FAULT
Test voltage
FAULT PINPOINTED
Component & System Testing
>100 MΩ
Experience with insulation testing, motor rewinding, and verification of AC/DC machines.
Allied Trades Practice
Skills in filing, hacksawing, sheet metal work, drilling, and threading to support holistic project execution.
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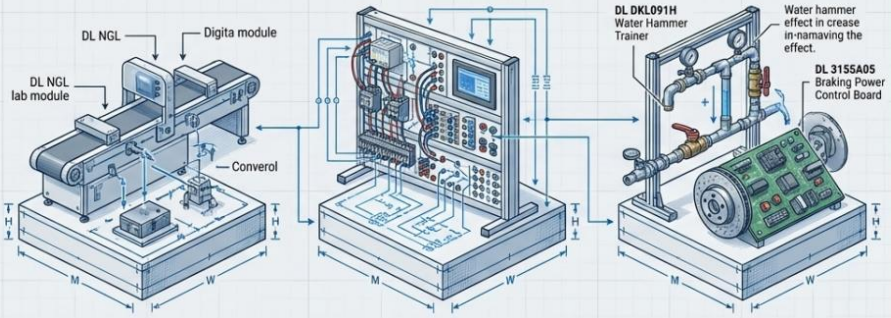
LAYER 4: THE DIDACTIC FRAMEWORK—ADVANCED PEDAGOGY AND LEARNING SYSTEMS.

A curriculum delivered through a modern pedagogical lens, integrating Work-Based Learning (WBL) with state-of-the-art didactic laboratory systems for an immersive educational experience.

Learning Models

- Experiential Learning ("Learning by Doing")
- Apprenticeship Models
- Competency-Based Learning frameworks

Industry-Leading Training Systems



De Lorenzo (DL) Modular System
Next Generation Lab Modules (DL NGL) for Big Data, IoT, and Conveyor Belt simulations (CIMSIM).

Lucas-Nülle InsTrain Panel
Project-based learning for wiring installation and safety systems testing as per DIN VDE standards.

Specialized Trainers
Computerized trainers for specialized fields like hydraulic systems (DL DKL091H) and automotive braking (DL 3155A05) for ABS/ASR/ESP.

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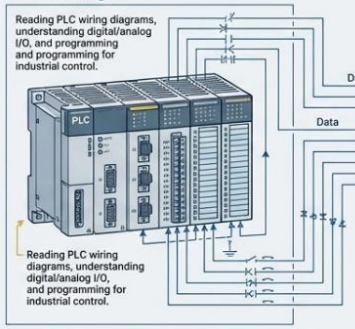
LAYER 5: THE AUTOMATION LAYER—COMMAND OF PLC, SCADA, AND ROBOTICS.

Expertise in the core technologies of industrial automation, moving beyond basic electrical skills to the design and management of complex, automated systems.

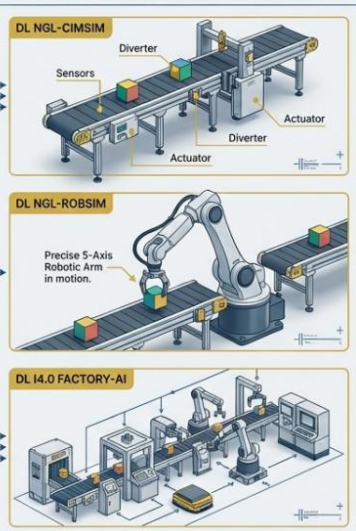
Control Logic


Reading PLC wiring diagrams, understanding digital/analog I/O, and programming and programming for industrial control.
PLC
Reading PLC wiring diagrams, understanding digital/analog I/O, and programming for industrial control.

Supervision & Monitoring

Data
Data

Simulated Industrial Environments



Data
Data
Data

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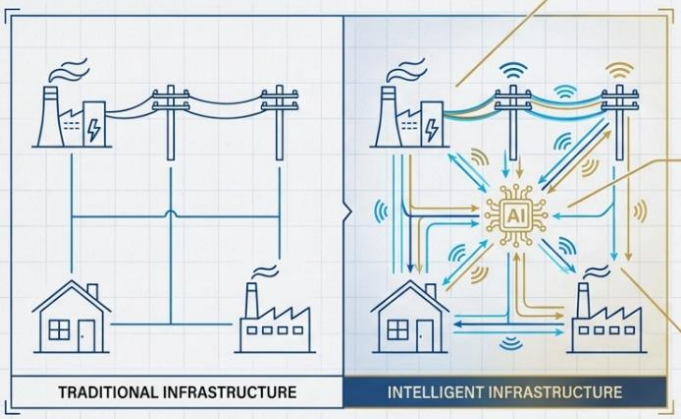
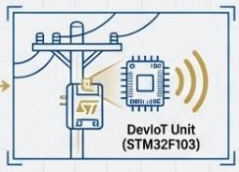
LAYER 6: THE SMART SYSTEMS LAYER—DEPLOYING IoT, SMART GRIDS, AND BIG DATA.

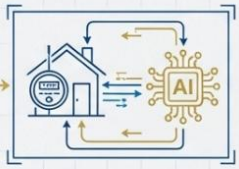
Designing and implementing intelligent infrastructure by integrating IoT devices, data analytics, and AI-driven control into traditional electrical networks.





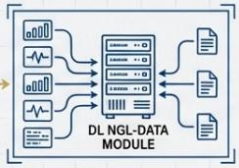
1. INTERNET OF THINGS (IoT)

Development on the DL NGL-IOT module, programming with C++/Arduino libraries for sensor/ actuator networks using MQTT protocols.



2. SMART GRID WITH AI

Competence with the DL SGWD-AI system, including smart meters, AI algorithms for predictive load management, and remote monitoring via SCADA-WEB over MODBUS RTU.



3. BIG DATA ANALYTICS

Understanding of the DL NGL-DATA module for analyzing large datasets in an industrial context.

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LAYER 7: THE INTELLIGENCE LAYER—ACHIEVING AI AND MACHINE LEARNING FLUENCY.

A disciplined approach to artificial intelligence, grounded in the Sci-Bono ICT Academy's AI Fluency Program, moving beyond application to a core understanding of AI principles.

FORMAL TRAINING

Sci-Bono ICT ACADEMY

Completion of the AI Fluency Program

- 44 videos, 6 Microsoft-recognized certifications

PHILOSOPHICAL UNDERPINNINGS

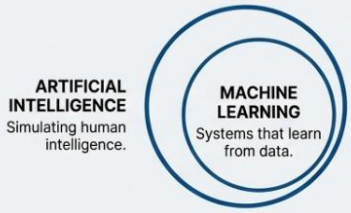
A. THE TURING TEST

Can a machine's responses be indistinguishable from a human's?

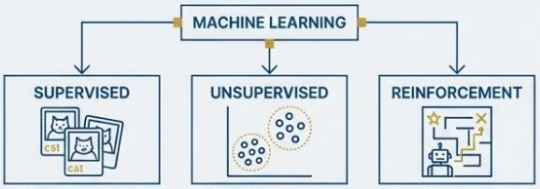
B. THE CHINESE ROOM ARGUMENT

Simulating knowledge vs. true understanding.

CORE DISTINCTIONS



TYPES OF MACHINE LEARNING



Example: spam detection

Example: customer segmentation

Example: game-playing AI

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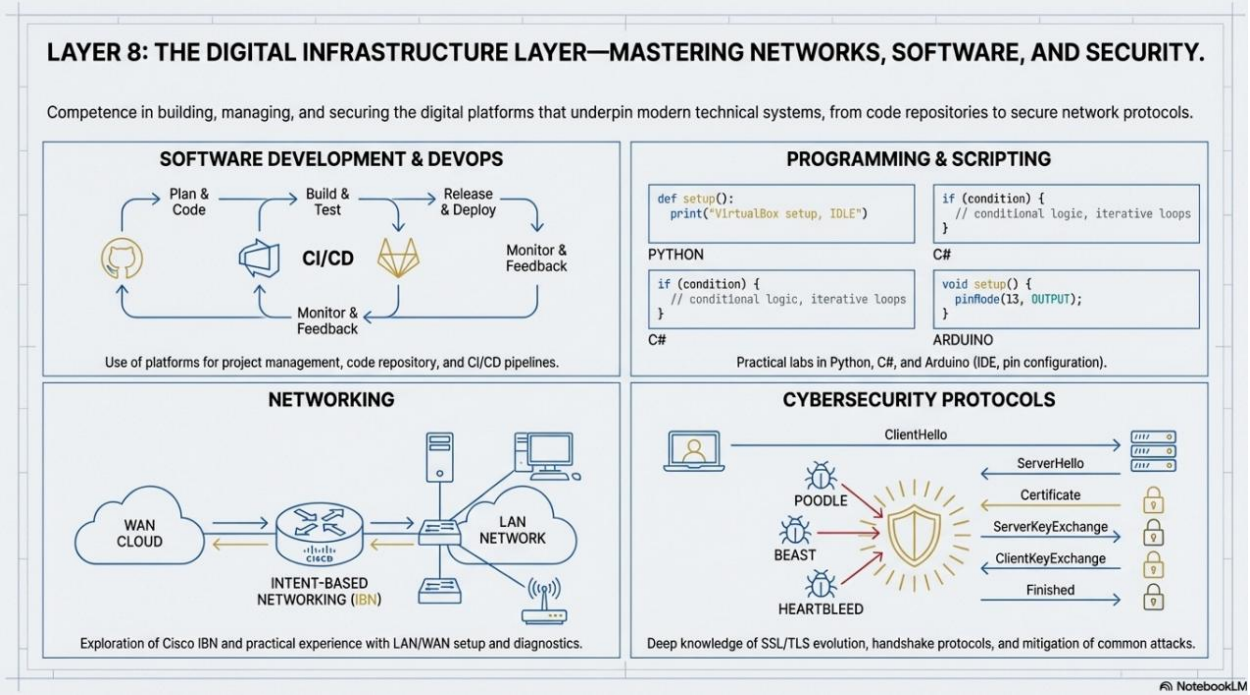
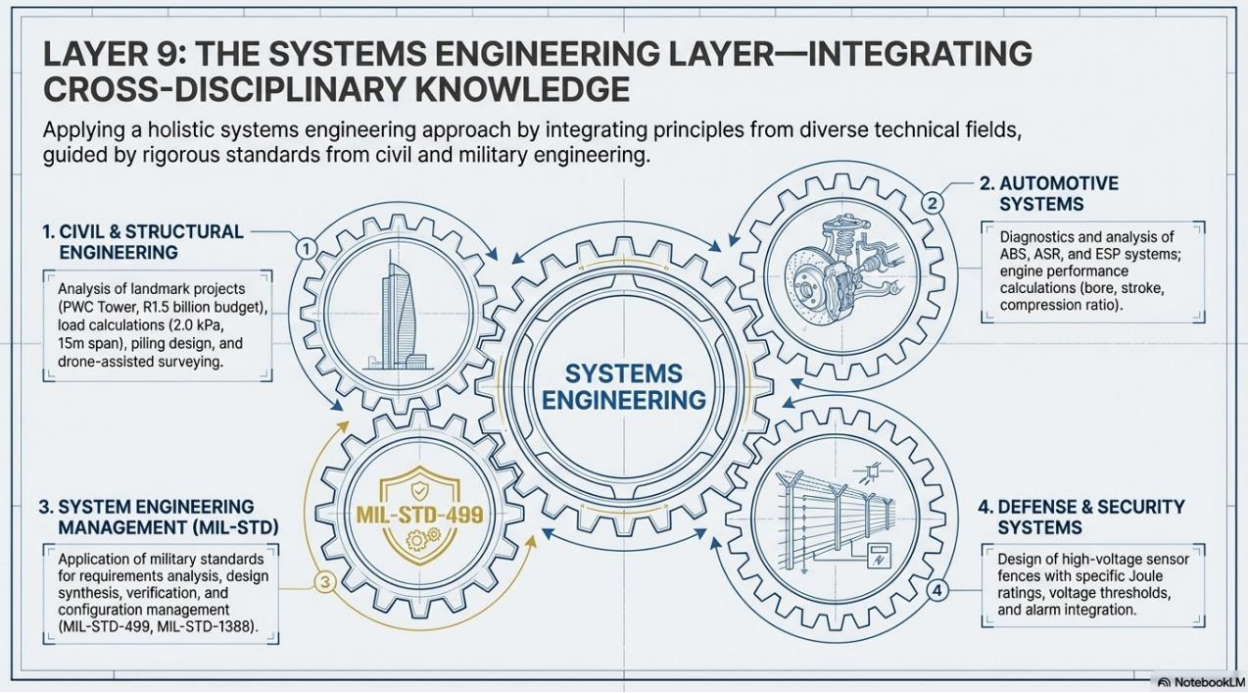
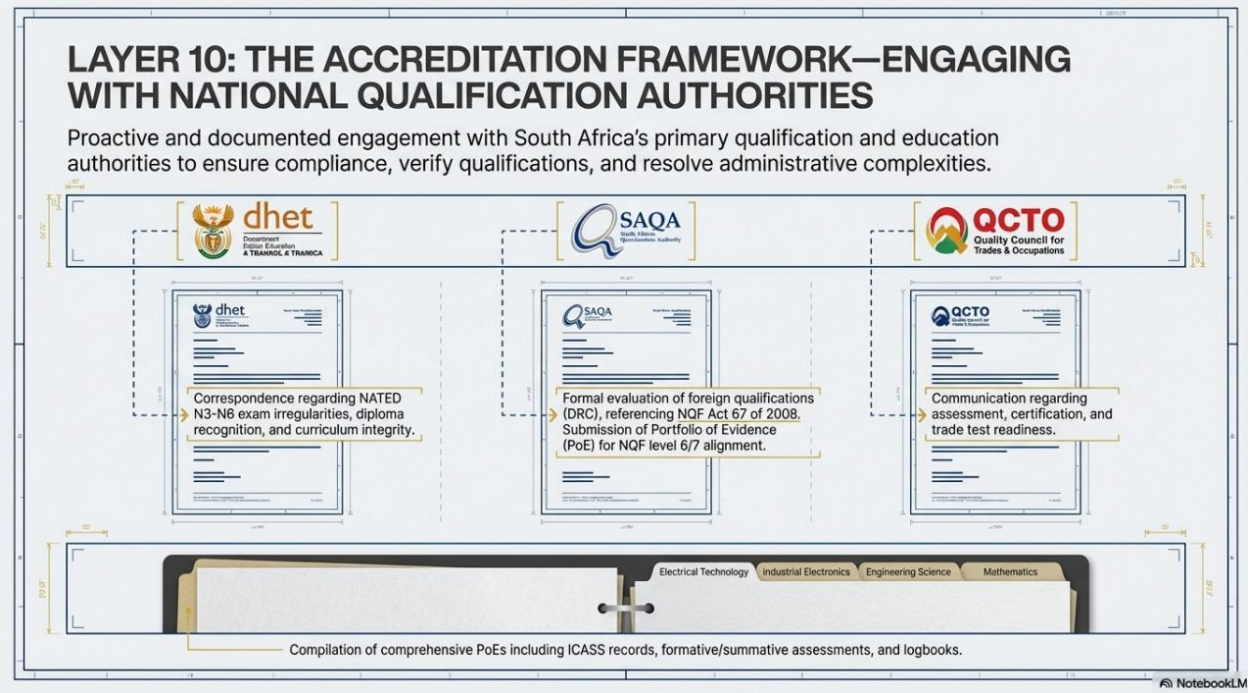

LAYER 8: THE DIGITAL INFRASTRUCTURE LAYER—MASTERING NETWORKS, SOFTWARE, AND SECURITY.
Competence in building, managing, and securing the digital platforms that underpin modern technical systems, from code repositories to secure network protocols.
SOFTWARE DEVELOPMENT & DEVOPS
Plan & Code
Build & Test
Release & Deploy
CI/CD
Monitor & Feedback
Monitor & Feedback
Use of platforms for project management, code repository, and CI/CD pipelines.
PROGRAMMING & SCRIPTING
def setup():
print("VirtualBox setup, IDLE")
PYTHON
if (condition) {
// conditional logic, iterative loops
}
C#
if (condition) {
// conditional logic, iterative loops
}
C#
void setup() {
pinMode(13, OUTPUT);
}
ARDUINO
Practical labs in Python, C#, and Arduino (IDE, pin configuration).
NETWORKING
WAN CLOUD
CI&CD
INTENT-BASED NETWORKING (IBN)
LAN NETWORK
Exploration of Cisco IBN and practical experience with LAN/WAN setup and diagnostics.
CYBERSECURITY PROTOCOLS
ClientHello
ServerHello
Certificate
ServerKeyExchange
ClientKeyExchange
Finished
POODLE
BEAST
HEARTBLEED
Deep knowledge of SSL/TLS evolution, handshake protocols, and mitigation of common attacks.
NotebookLM


LAYER 9: THE SYSTEMS ENGINEERING LAYER—INTEGRATING CROSS-DISCIPLINARY KNOWLEDGE
Applying a holistic systems engineering approach by integrating principles from diverse technical fields, guided by rigorous standards from civil and military engineering.
1. CIVIL & STRUCTURAL ENGINEERING
Analysis of landmark projects (PWC Tower, R1.5 billion budget), load calculations (2.0 kPa, 15m span), piling design, and drone-assisted surveying.
2. AUTOMOTIVE SYSTEMS
Diagnostics and analysis of ABS, ASR, and ESP systems; engine performance calculations (bore, stroke, compression ratio).
SYSTEMS ENGINEERING
MIL-STD-499
3. SYSTEM ENGINEERING MANAGEMENT (MIL-STD)
Application of military standards for requirements analysis, design synthesis, verification, and configuration management (MIL-STD-499, MIL-STD-1388).
4. DEFENSE & SECURITY SYSTEMS
Design of high-voltage sensor fences with specific Joule ratings, voltage thresholds, and alarm integration.
NotebookLM


LAYER 10: THE ACCREDITATION FRAMEWORK—ENGAGING WITH NATIONAL QUALIFICATION AUTHORITIES
Proactive and documented engagement with South Africa's primary qualification and education authorities to ensure compliance, verify qualifications, and resolve administrative complexities.
dhet
SAQA
QCTO
Quality Council for Trades & Occupations
Correspondence regarding NATED N3-N6 exam irregularities, diploma recognition, and curriculum integrity.
Formal evaluation of foreign qualifications (DRC), referencing NQF Act 67 of 2008. Submission of Portfolio of Evidence (PoE) for NQF level 6/7 alignment.
Communication regarding assessment, certification, and trade test readiness.
Electrical Technology
Industrial Electronics
Engineering Science
Mathematics
Compilation of comprehensive PoEs including ICASS records, formative/summative assessments, and logbooks.
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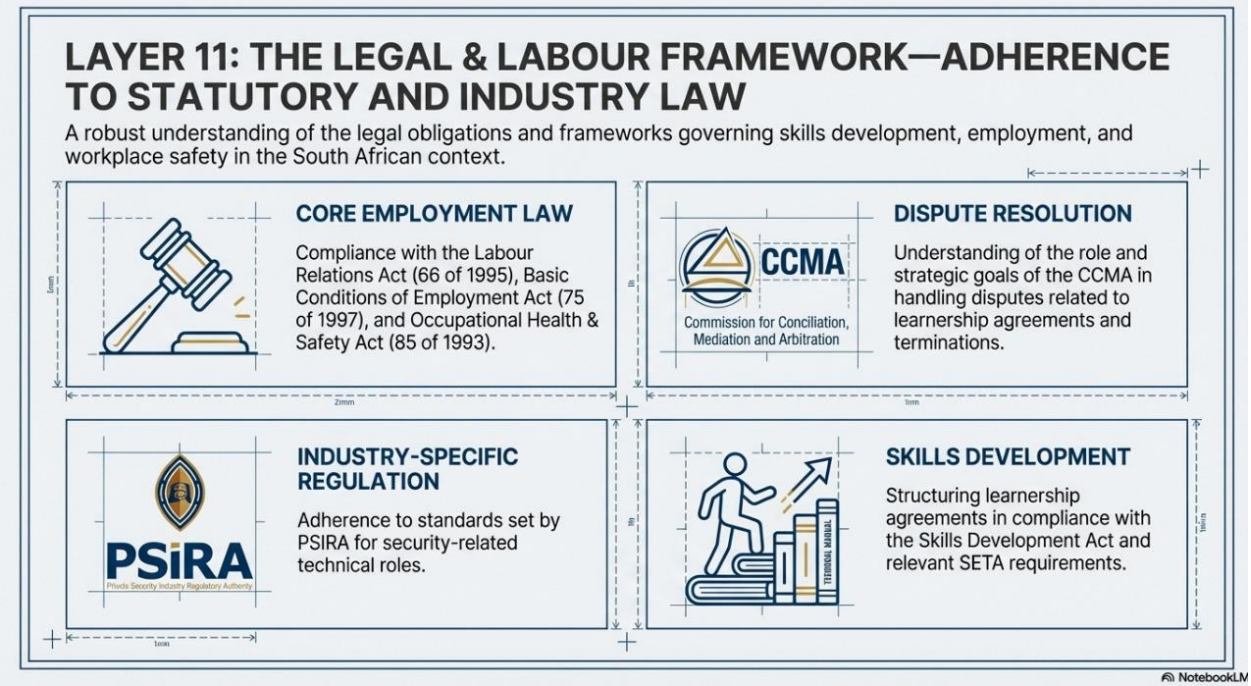
LAYER 11: THE LEGAL & LABOUR FRAMEWORK—ADHERENCE TO STATUTORY AND INDUSTRY LAW
A robust understanding of the legal obligations and frameworks governing skills development, employment, and workplace safety in the South African context.
CORE EMPLOYMENT LAW
Compliance with the Labour Relations Act (66 of 1995), Basic Conditions of Employment Act (75 of 1997), and Occupational Health & Safety Act (85 of 1993).
DISPUTE RESOLUTION
CCMA
Commission for Conciliation, Mediation and Arbitration
Understanding of the role and strategic goals of the CCMA in handling disputes related to learnership agreements and terminations.
INDUSTRY-SPECIFIC REGULATION
PSiRA
Adherence to standards set by PSIRA for security-related technical roles.
SKILLS DEVELOPMENT
Structuring learnership agreements in compliance with the Skills Development Act and relevant SETA requirements.
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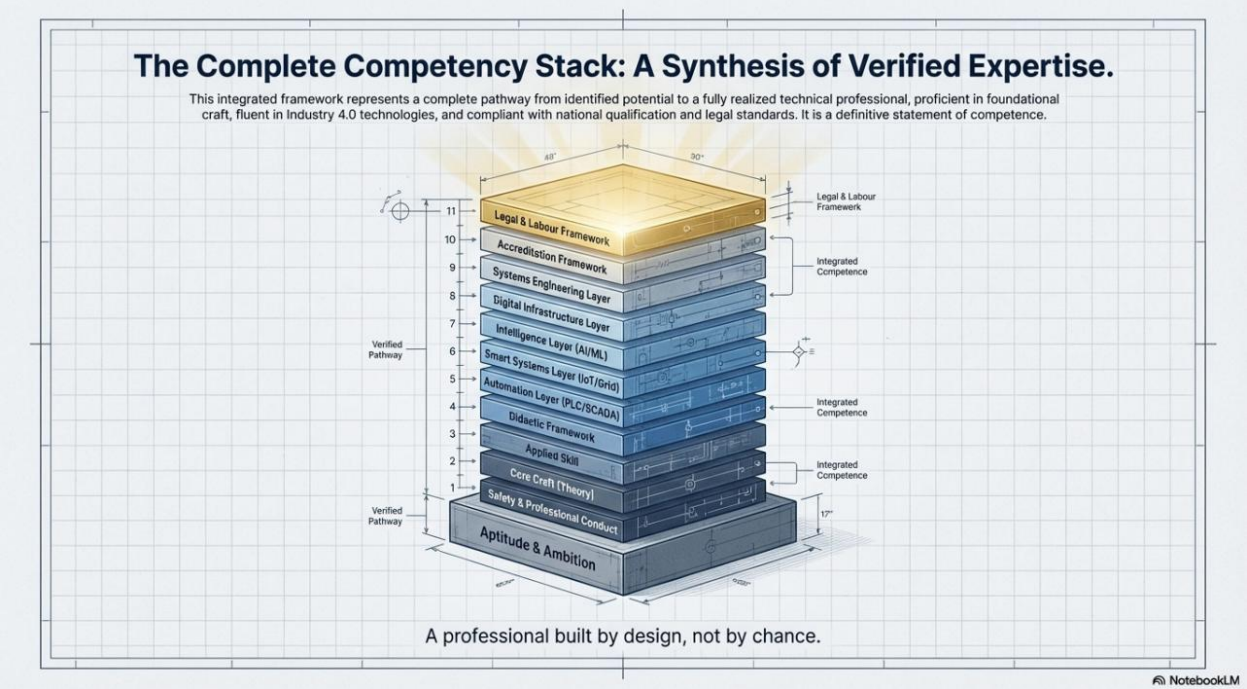
The Complete Competency Stack: A Synthesis of Verified Expertise.
This integrated framework represents a complete pathway from identified potential to a fully realized technical professional, proficient in foundational craft, fluent in Industry 4.0 technologies, and compliant with national qualification and legal standards. It is a definitive statement of competence.
Legal & Labour Framework
Accreditation Framework
Systems Engineering Layer
Digital Infrastructure Layer
Intelligence Layer (AI/ML)
Smart Systems Layer (IoT/Grid)
Automation Layer (PLC/SCADA)
Didactic Framework
Applied Skill
Core Craft (Theory)
Safety & Professional Conduct
Aptitude & Ambition
Legal & Labour Framework
Integrated Competence
Integrated Competence
Integrated Competence
Verified Pathway
Verified Pathway
A professional built by design, not by chance.
NotebookLM

The Blueprint for an Auditable Engineerile Engineering Career

To illustrate the key components required to build a modern, verifiable, and high-integrity career in engineering, integrating technical qualifications, regulatory compliance, and digital management.

THE TECHNICAL & REGULATORY FOUNDATION

The Cornerstone Qualification: National N Diploma

Non-Negotiable Safety Compliance

Security Vetting is a Career Gateway

The Cornerstone National N Diploma
Achieved by combining N4-N6 theory with 24 months of verified workplace experience.

Non-Negotiable Safety Compliance
Mastery of standards like SANS 10142 for electrical installations is mandatory.

Security Vetting is a Career Gateway
PSIRA regulations require formal clearance, linking engineering roles to national security.

THE DIGITAL & INTELLECTUAL EDGE

The Digital Portfolio of Evidence (PoE)

Use automation (VBA, LMS) to create a single, auditable, and self-validating career artifact.

Adopting a High-Reliability Mindset

Military standards (MIL-STD-11991B) inform best practices by forbidding failure-prone components.

Future-Proofing with AI & Advanced Math

Move from reactive fixing to proactive prediction using AI and Laplace/ Fourier transforme.

Prohibited Item & Rationale (from MIL-STD-11981B)

PVC Plastics & Insulation	Degrades by out-gassing, is flammable, and releases toxic fomes when burning.
Specific Locking Devices	Sheet spring nuts and fiber inserts pose vibration and shape retention risks.
Circuit Protection Fuses	Unpredictable failure characteristics and require extensive maintenance for replacement.

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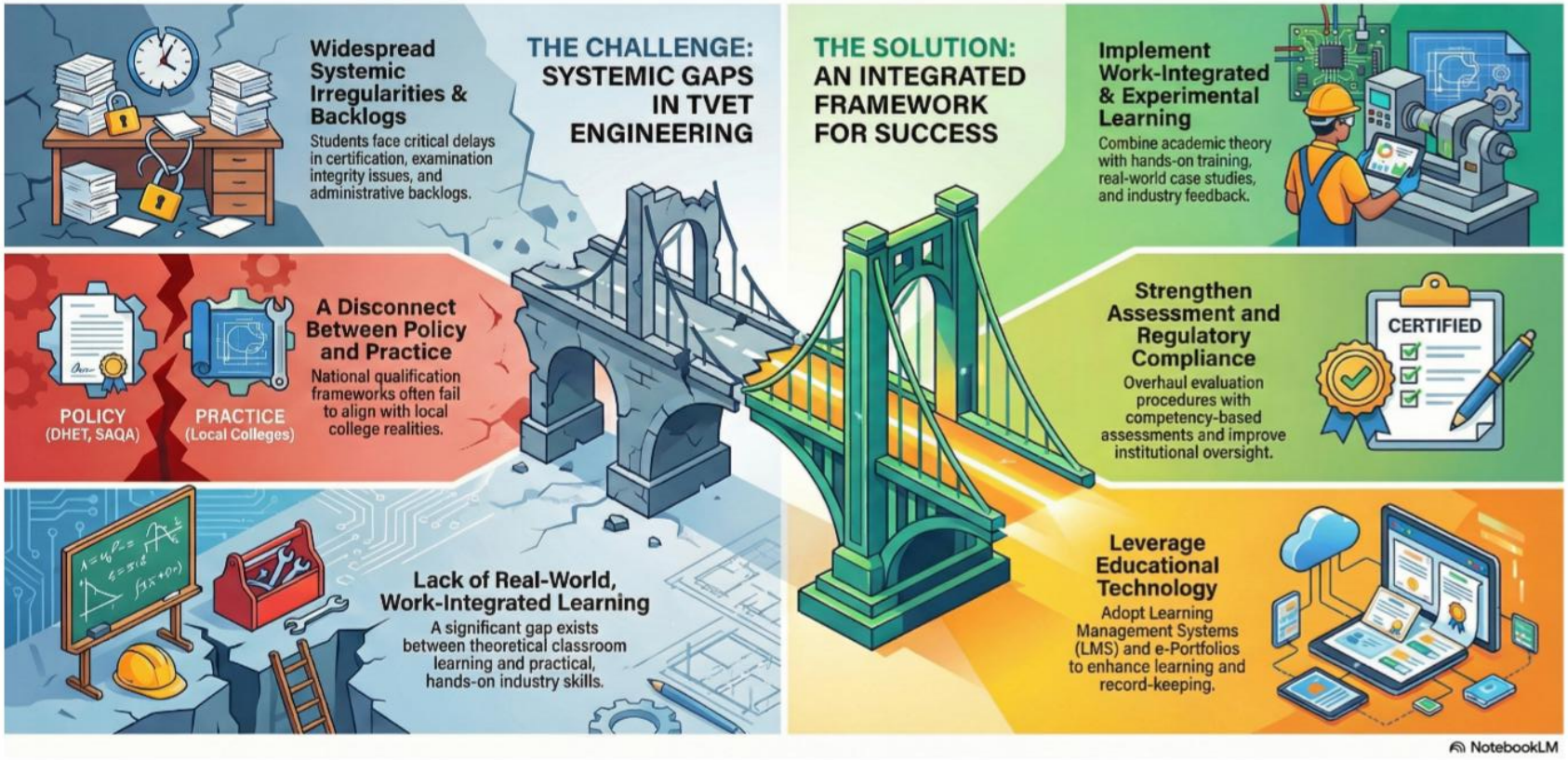
Bridging the Gap: Reforming Vocational Engineering Education in South Africa


Widespread Systemic Irregularities & Backlogs
Students face critical delays in certification, examination integrity issues, and administrative backlogs.
THE CHALLENGE: SYSTEMIC GAPS IN TVET ENGINEERING
THE SOLUTION: AN INTEGRATED FRAMEWORK FOR SUCCESS
Implement Work-Integrated & Experimental Learning
Combine academic theory with hands-on training, real-world case studies, and industry feedback.
POLICY (DHET, SAQA)
PRACTICE (Local Colleges)
A Disconnect Between Policy and Practice
National qualification frameworks often fail to align with local college realities.
Strengthen Assessment and Regulatory Compliance
Overhaul evaluation procedures with competency-based assessments and improve institutional oversight.
CERTIFIED
Lack of Real-World, Work-Integrated Learning
A significant gap exists between theoretical classroom learning and practical, hands-on industry skills.
Leverage Educational Technology
Adopt Learning Management Systems (LMS) and e-Portfolios to enhance learning and record-keeping.
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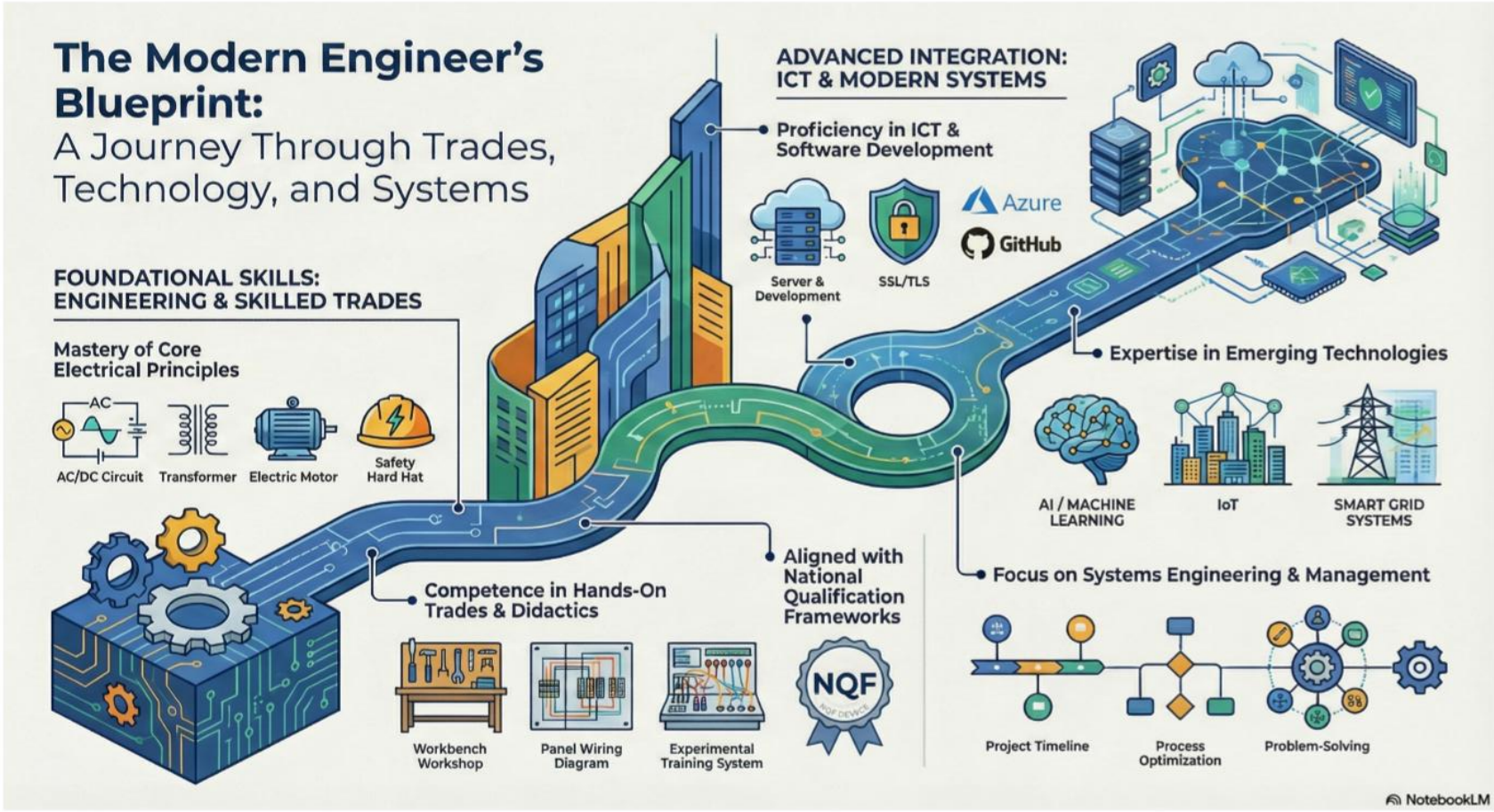
The Modern Engineer's Blueprint:
A Journey Through Trades, Technology, and Systems
FOUNDATIONAL SKILLS: ENGINEERING & SKILLED TRADES
Mastery of Core Electrical Principles
AC
AC/DC Circuit
Transformer
Electric Motor
Safety Hard Hat
Competence in Hands-On Trades & Didactics
Workbench Workshop
Panel Wiring Diagram
Experimental Training System
Aligned with National Qualification Frameworks
NQF
ADVANCED INTEGRATION: ICT & MODERN SYSTEMS
Proficiency in ICT & Software Development
Server & Development
SSL/TLS
Azure
GitHub
Expertise in Emerging Technologies
AI / MACHINE LEARNING
IoT
SMART GRID SYSTEMS
Focus on Systems Engineering & Management
Project Timeline
Process Optimization
Problem-Solving
NotebookLM

Building a Career in Engineering: A Multifaceted Journey

Building the Foundation

Grounded in National Technical Education Programs
Mastered core electrical trade theory through NATED and NCV syllabi.

Advanced Mathematical and Scientific Proficiency.
Applied advanced calculus and engineering science to solve complex, real-world problems.

Expertise in Core Electrical Systems and Technologies.
includes AC/DC machines, PLCs, transformers, and circuit theory.

DHET: Department of Higher Education & Training

SAQA: South African Qualifications Authority

QCTO: Quality Council for Trades & Occupations

Professional Application & Growth

Diversified Skills Through Continuous Online Learning
Earned multiple certificates and diplomas from platforms like Alison and Microsoft.

Authored Ambitious Research in Modern Engineering.
Developed thesis proposals on rural energy, smart gride, AI, and IoT systems.

Actively Pursued High-Level Technical and Specialist Roles.
Applied to leading organizations like SARS, Eston, and Schneider Electric.

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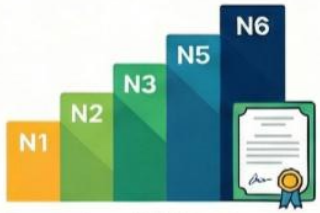
Navigating Your Career Path in South Africa: From Education to Employment

1. Build Your Educational Foundation

Understand NATED Qualifications

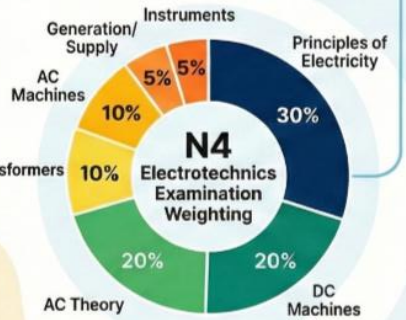


Progress through N1-N6 levels to Progress through N1-N6 levels to build technical, theoretical, and practical skills for your chosen vocation.

Get Your Qualifications Verified by SAQA

SAQA

The South African Qualifications Authority (SAQA) evaluates qualifications to ensure they meet national standards.



Lifelong Learning is Key

Continuously upgrade your skills with certifications in areas like Industrial Automation, IT, and Renewable Energy.

2. Gain Practical Experience

Integrate Workplace-Based Learning

Combine academic studies with practical, on-the-job training like internships or apprenticeships to enhance employability.

Master Essential Technical Skills

Focus on core competencies like electrical wiring, circuit design, soldering, and using diagnostic tools.

Build a Portfolio of Evidence (PoE)

Document all your projects, assignments, and work experience to showcase your skills to employers and accreditation bodies.

3. Know Your Rights

Your Personal Information is Protected (POPIA)

Employers must protect your personal data and cannot process it without your consent or legal obligation.

Address Workplace Disputes

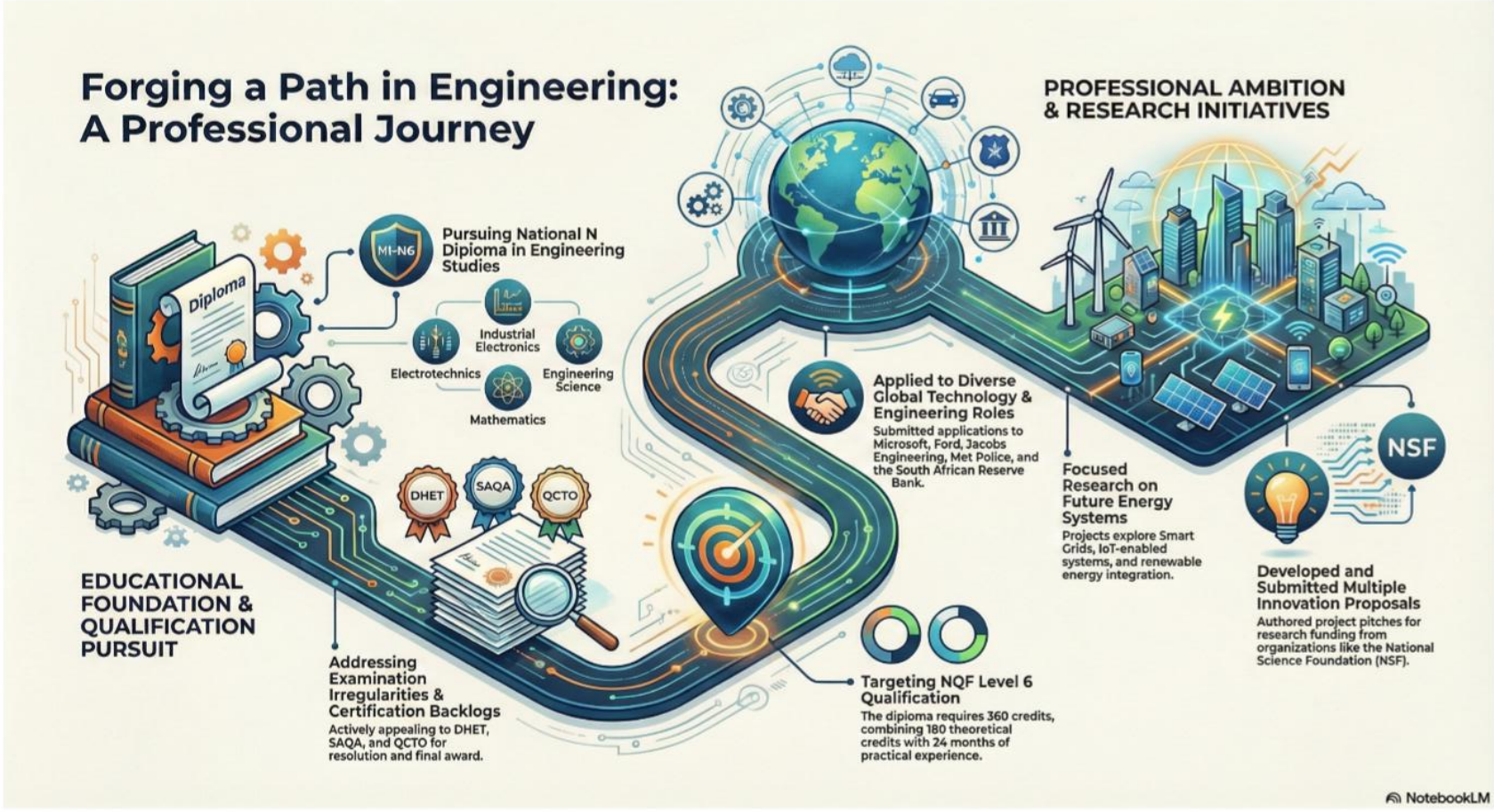
CCMA

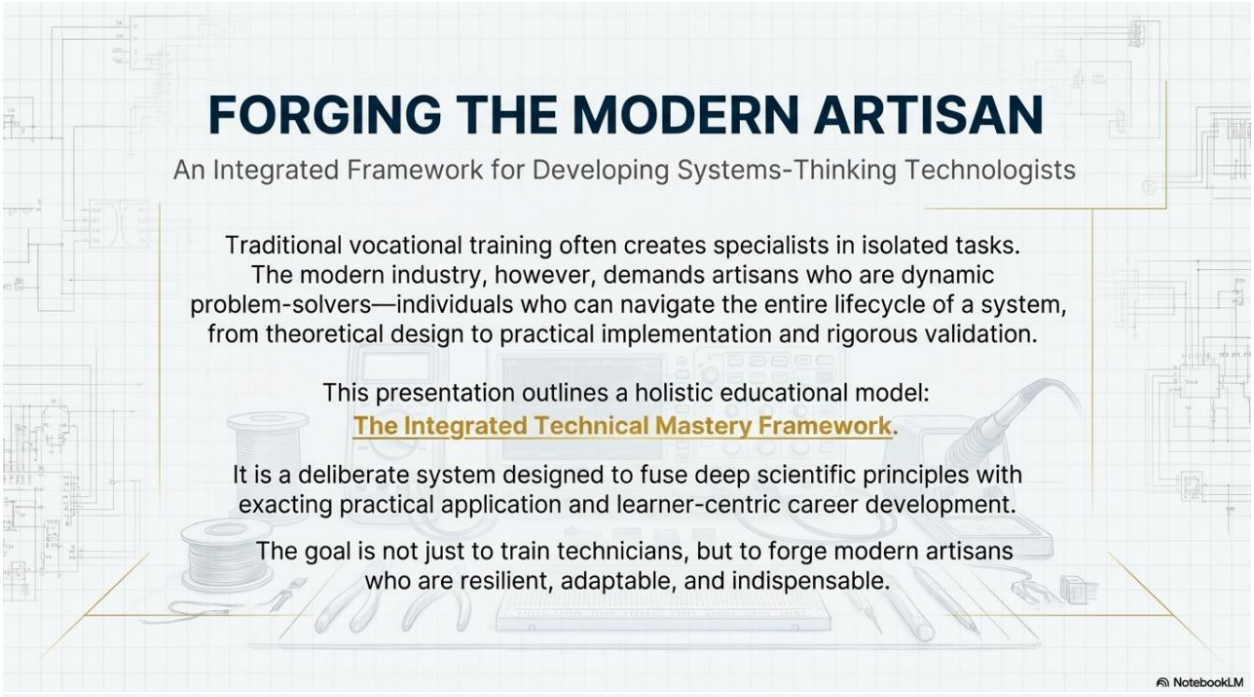
Use institutions like the CCMA (Commission for Conciliation, Mediation and Arbitration) to resolve labor-related issues.

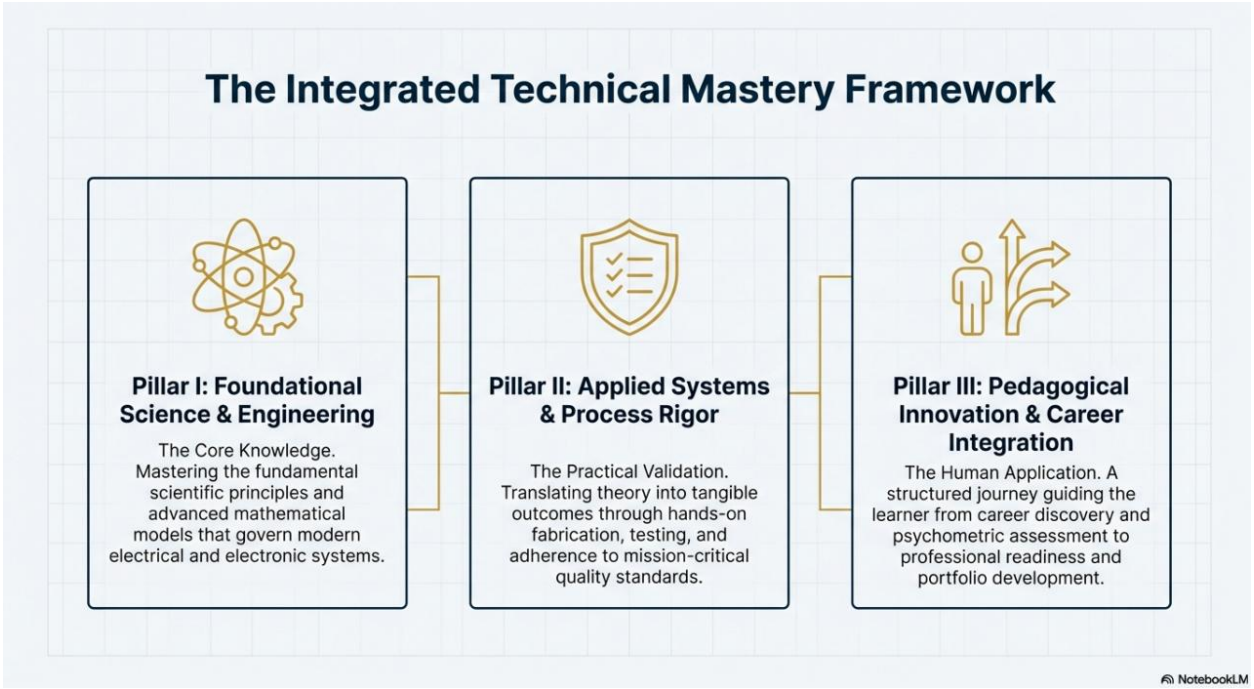
How to Obtain a Protection Order

If you face damastic violence or harassment, you can apply for a court-issued protection order for your safety.

NotebookLM


Forging a Path in Engineering: A Professional Journey
PROFESSIONAL AMBITION & RESEARCH INITIATIVES
Diploma
MI-N6
Pursuing National N Diploma in Engineering Studies
Industrial Electronics
Electrotechnics
Engineering Science
Mathematics
DHET
SAQA
QCTO
EDUCATIONAL FOUNDATION & QUALIFICATION PURSUIT
Addressing Examination Irregularities & Certification Backlogs
Actively appealing to DHET, SAQA, and QCTO for resolution and final award.
Targeting NQF Level 6 Qualification
The diploma requires 360 credits, combining 180 theoretical credits with 24 months of practical experience.
Applied to Diverse Global Technology & Engineering Roles
Submitted applications to Microsoft, Ford, Jacobs Engineering, Met Police, and the South African Reserve Bank.
Focused Research on Future Energy Systems
Projects explore Smart Grids, IoT-enabled systems, and renewable energy integration.
NSF
Developed and Submitted Multiple Innovation Proposals
Authored project pitches for research funding from organizations like the National Science Foundation (NSF).
NotebookLM


FORGING THE MODERN ARTISAN
An Integrated Framework for Developing Systems-Thinking Technologists
Traditional vocational training often creates specialists in isolated tasks. The modern industry, however, demands artisans who are dynamic problem-solvers—individuals who can navigate the entire lifecycle of a system, from theoretical design to practical implementation and rigorous validation.
This presentation outlines a holistic educational model: The Integrated Technical Mastery Framework.
It is a deliberate system designed to fuse deep scientific principles with exacting practical application and learner-centric career development.
The goal is not just to train technicians, but to forge modern artisans who are resilient, adaptable, and indispensable.
NotebookLM


The Integrated Technical Mastery Framework
Pillar I: Foundational Science & Engineering
The Core Knowledge. Mastering the fundamental scientific principles and advanced mathematical models that govern modern electrical and electronic systems.
Pillar II: Applied Systems & Process Rigor
The Practical Validation. Translating theory into tangible outcomes through hands-on fabrication, testing, and adherence to mission-critical quality standards.
Pillar III: Pedagogical Innovation & Career Integration
The Human Application. A structured journey guiding the learner from career discovery and psychometric assessment to professional readiness and portfolio development.
NotebookLM

Pillar I: Foundational Science & Engineering

A Curriculum Built on Comprehensive NATED Standards

The framework is rooted in the nationally recognized NATED (National Accredited Technical Education Diploma) syllabi, ensuring a robust theoretical foundation. This covers a spectrum from foundational principles to advanced applications.

Electrotechnics (N4-N6)	Industrial Electronics (N3-N6)	Mathematics (N4-N6)	Foundational Sciences
• DC/AC Machines • Transformers • Power Generation & Supply	• Power Supplies • Amplifiers • Integrated Circuits • Oscillators • Phase Control	• Determinants • Complex Numbers • Trigonometry • Differential & Integral Calculus	• Engineering Science (N4): Kinematics, Dynamics, Statics, Hydraulics • Digital Electronics: Binary Logic, Boolean Algebra, Logic Gates

Key Takeaway Text: This is not just a list of subjects; it's a curated knowledge base designed to build a deep, intuitive understanding of electrical and electronic systems from first principles.

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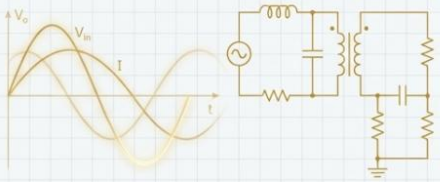
Pillar I: Foundational Science & Engineering

Where Advanced Mathematics Meets Practical Engineering

We don't just teach theory; we apply advanced mathematical tools directly to engineering problems. This integration ensures graduates can model, analyze, and optimize complex systems, not just follow diagrams.



AC Circuit Analysis

NATED Module:
Electrotechnics N5 - Alternating Current Theory

Application:
To accurately determine the true power and efficiency of complex AC systems, we move beyond simple multiplication. We use integral calculus to calculate RMS values and analyze power loss in transmission.

Calculating RMS via Integration

$$V_{\text{rms}} = \sqrt{\frac{1}{T}\int_0^T v(t)^2 dt}$$

Power Loss in Transmission (Integrals and Derivatives)

$$P_{\text{avg}} = \frac{1}{T}\int_0^T p(t)dt \qquad \frac{dP_{\text{loss}}}{dt} = \cdots$$

Electromagnetic Systems

NATED Module:
Electrotechnics N4 - Electromagnetic Induction

Application:
Understanding how transformers and generators work requires analyzing rates of change. We use derivatives to apply Faraday's Law, modeling how changing magnetic flux induces voltage.

Faraday's Law with Derivatives: $E = -\frac{d\Phi}{dt}$

$$E = -N\frac{d\Phi}{dt}$$

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Pillar II: Applied Systems & Process Rigor

From the Lab Bench to Mission-Critical Application

Theoretical knowledge is incomplete without rigorous practical validation. This pillar bridges the gap by transforming abstract concepts into tangible, reliable systems. Every practical task, from basic component testing to full system assembly, is framed by the discipline of industrial and military-grade standards.

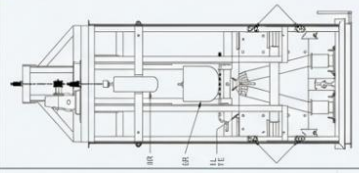
Hands-On Lab Tasks

- Transistor as Electronic Switch
- Series Voltage Regulator Construction
- PCB Fabrication & Etching
- Power Control Circuit Assembly (TRIAC/SCR/IGBT)

Validated By

High-Stakes Standards

- **MIL-STD-11991B**: Parts, Materials, and Processes (PM&P) Management
- **MIL-STD-202**: Test Methods for Electronic and Electrical Component Parts
- Psychometrical/Statistical Tracking: Mean & Variance for Reliability
- Audit-Ready Documentation



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Pillar II: Applied Systems & Process Rigor

Implementing Military-Grade Lifecycle & Quality Management

Adherence to standards is demonstrated through the implementation of key requirements from MIL-STD-11991B. This ensures every component and process is managed for maximum reliability and traceability.

Clause	Requirement	Framework Application
4.4.1	**Procurement**	Ensure procurement meets system requirements via controlled supplier approval.
4.4.2	**Counterfeit Prevention**	Implement protocols to avoid counterfeit parts and control their impact.
4.4.5	**Change Monitoring**	Detect, track, and assess the impact of supplier changes on system performance.
4.4.7	**Design/Use Data**	Collect, store, and analyze all relevant PM&P data; enforce traceability.
4.4.11	**Supply Chain Risk**	Assess and mitigate supply chain risks (threats, vulnerabilities, disruptions).

This is not just about building circuits; it's about building certifiable, defense-grade systems.

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Pillar II: Applied Systems & Process Rigor

Creating Audit-Ready, Data-Driven Documentation Systems

We go beyond manual logbooks. Using Visual Basic, we build custom modules to automate testing, logging, and statistical analysis. This creates an unimpeachable, audit-ready record of every practical task, ensuring consistency and quality control.

Module: IntegratedAuditFramework

(General)

```
' Purpose: Unified logging and analysis for electrical tests
Type RelayTest
    TestID As String
    TapCurrent As Double
    FaultCurrent As Double
    TripTimeActual As Double
    ErrorPercent As Double
End Type

Public Sub LogRelayTest(ByRef r As RelayTest)
    r.FaultCurrent = r.TapCurrent * r.Multiplier
    ' ... error calculation ...
End Sub
```

Automated Test Log & Analysis

	A	B	C	D	E	F
1	Transistor Label	Test Results (A)	Status	Mean	Variance	Error %
2	TR-001	10.02	Pass	10.00	0.0004	0.20%
2	TR-002	9.98	Pass	10.00	0.0004	0.20%
3	TR-003	10.05	Fail	10.00	0.0004	0.50%

- Automates data capture during lab sessions.
- Enforces pass/fail gates based on set tolerances.
- Calculates statistical reliability (mean, variance).
- Generates an auditable, time-stamped record of work.

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Pillar III: Pedagogical Innovation & Career Integration

Mapping the Learner Journey: From Discovery to Deployment

Technical skills must be paired with career strategy. This pillar guides learners through a structured pathway that begins with self-assessment, moves through targeted learning, and culminates in a professional portfolio that demonstrates readiness for the job market.

Career Discovery & Assessment

Utilizing Sci-Bono Career Center intake and National Career Advice Portal (NCAP) psychometric tests to identify aptitudes, interests, and preferred work environments.

Personalized Learning Pathway

Selecting tailored NATED modules and supplementary courses (e.g., Alison online diplomas) that align with assessment results and career goals.

Portfolio & Evidence Development

Every practical task and project is documented, creating tangible evidence of skills. This includes code, schematics, and test results.

Career Readiness & Integration

Developing job search skills, CV writing, and interview preparation, leading to certifications and readiness for employment or entrepreneurship.

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Pillar III: Pedagogical Innovation & Career Integration

Data-Driven Guidance: Aligning Aptitude with Opportunity

The learner's journey starts with objective data. By using the National Career Advice Portal (NCAP), we identify a learner's innate abilities and align them with career fields where they are most likely to succeed.

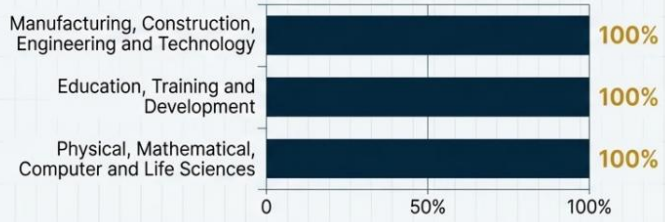
The Assessment

A psychometric tool that assesses a learner's talents, skills, and abilities.

Sample question areas:

- Problem-solving skills
- Hands-on competency
- Logical and methodical approach
- Creative and practical solutions

The Results



→ The results provide a clear, evidence-based mandate to guide the learner towards an engineering and technology pathway.

higher education and training
Department: Higher Education and Training
REPUBLIC OF SOUTH AFRICA

kheth a
Make the right choice. Decide your future.

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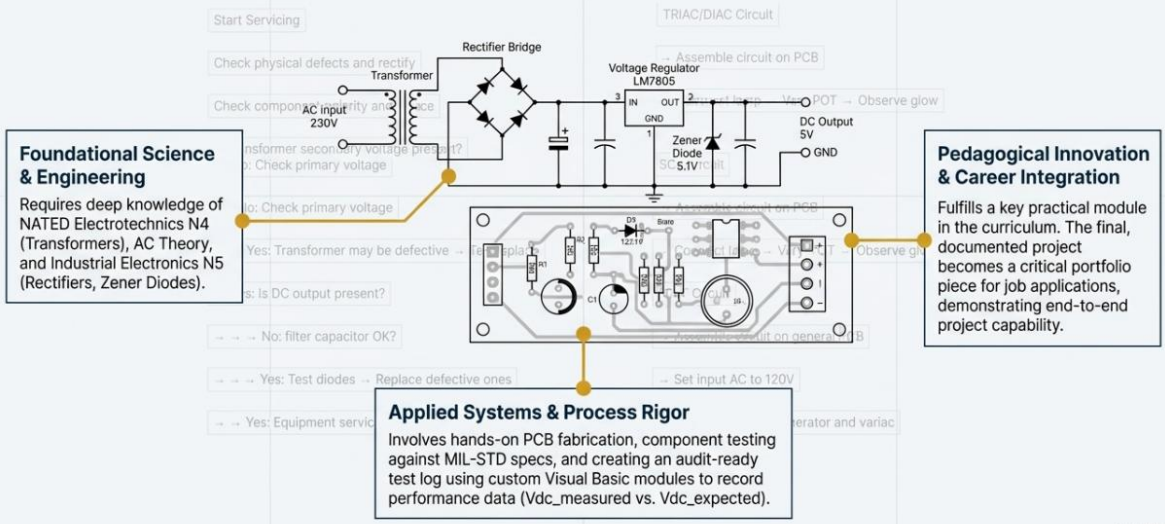
The Synthesis: Integrating All Pillars in a Capstone Project

Case Study: Designing and Auditing a Regulated Power Supply



Foundational Science & Engineering

Requires deep knowledge of NATED Electrotechnics N4 (Transformers), AC Theory, and Industrial Electronics N5 (Rectifiers, Zener Diodes).

Pedagogical Innovation & Career Integration

Fulfills a key practical module in the curriculum. The final, documented project becomes a critical portfolio piece for job applications, demonstrating end-to-end project capability.

Applied Systems & Process Rigor

Involves hands-on PCB fabrication, component testing against MIL-STD specs, and creating an audit-ready test log using custom Visual Basic modules to record performance data (Vdc_measured vs. Vdc_expected).

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Scaling the Framework to Complex Industrial Systems

The principles of integrated mastery are not limited to the lab. The framework is designed to prepare artisans for the complexity of modern industrial and utility-scale systems. The same methodology of combining deep theory with rigorous, documented practice applies to:

Thermal Power Plants

Analyzing steam generation, turbines, and alternators with a focus on efficiency and safety protocols.

Hydro-Electric Power Plants

Understanding turbine mechanics, schematics, and transformer specifications for high-voltage transmission.

Renewable Energy Systems

Solar Power: Designing array strings, combiner boxes, and grid interconnects. Logging performance data via SCADA.
Wind Power: Analyzing rotor aerodynamics, gearbox mechanics, and yaw control systems.

Transmission & Distribution Substations

Testing circuit breakers, relays, and CT/PT systems using current injection units and documenting trip times.

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The Outcome: A New Generation of Systems-Thinking Artisans

The Integrated Technical Mastery Framework produces more than just qualified technicians. It cultivates professionals who are:

- **Analytically Rigorous**: They understand the 'why' behind the 'how', using first principles and advanced mathematics to solve novel problems.
- **Practically Grounded**: Their skills are validated against the highest industry and military standards, ensuring reliability and quality.
- **Strategically Minded**: They see the entire system, from component lifecycle to career integration, making them valuable assets in any technical organization.

This portfolio serves as the definitive evidence of this framework's validity and its capacity to build the engineering talent required for the challenges of tomorrow.

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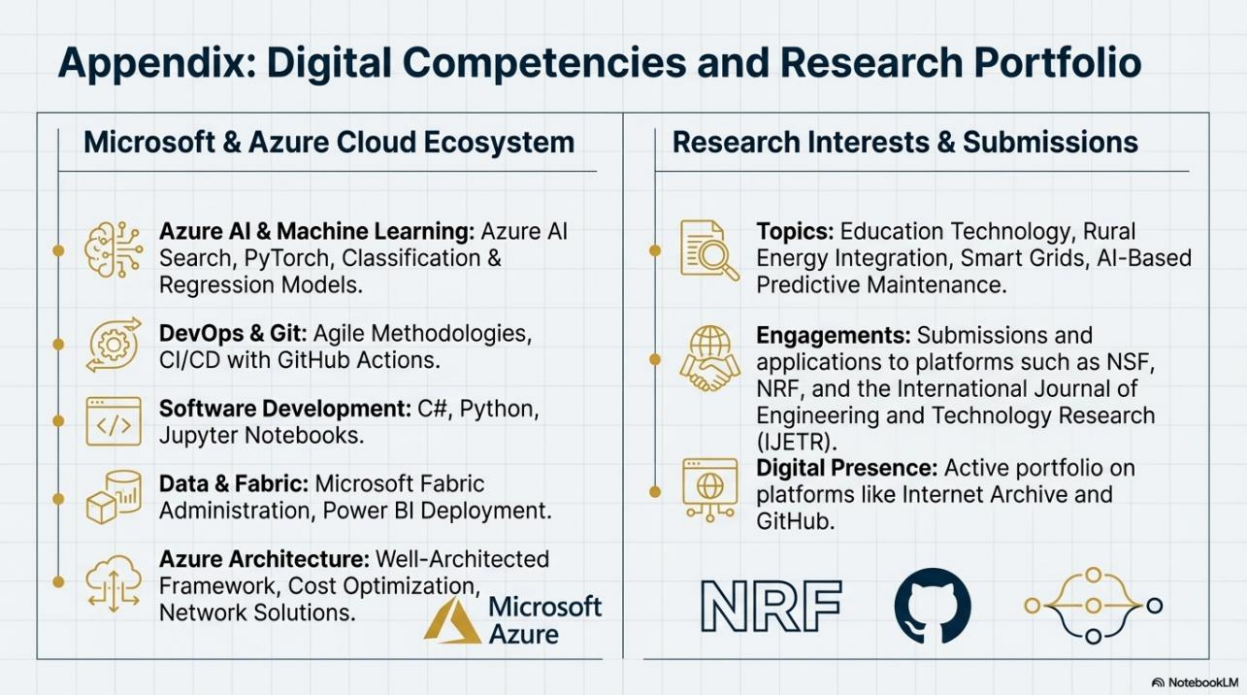
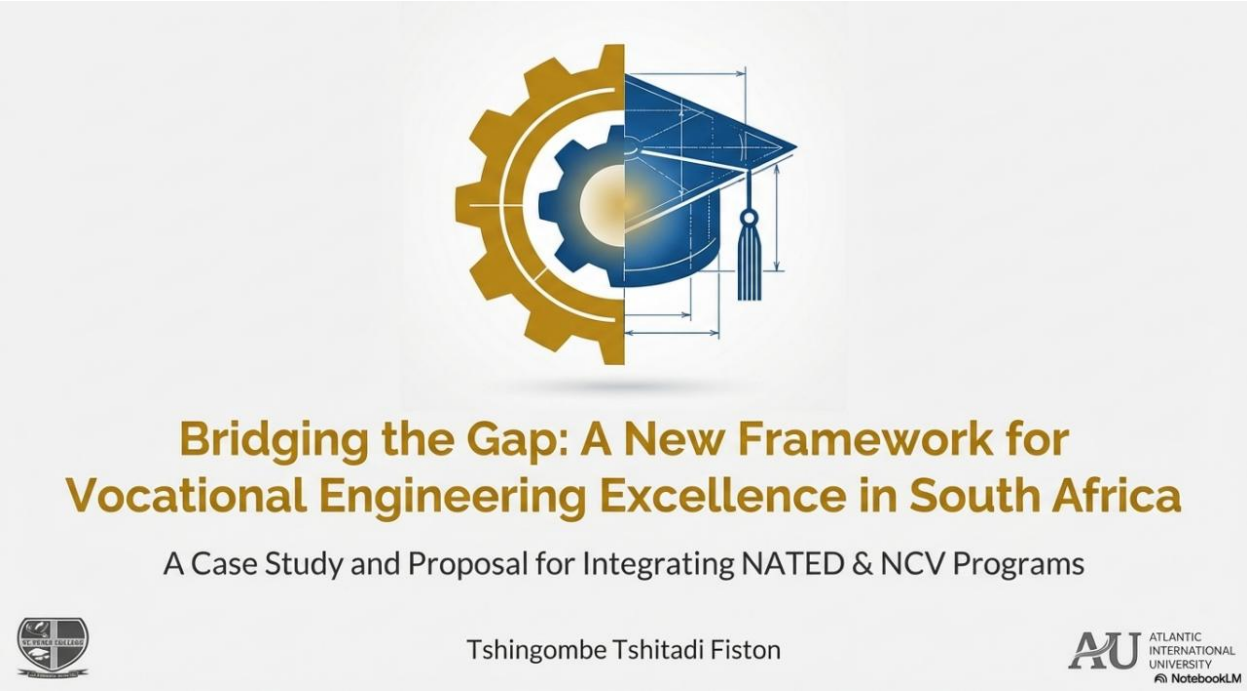

Appendix: Digital Competencies and Research Portfolio
Microsoft & Azure Cloud Ecosystem
Azure AI & Machine Learning: Azure AI Search, PyTorch, Classification & Regression Models.
DevOps & Git: Agile Methodologies, CI/CD with GitHub Actions.
Software Development: C#, Python, Jupyter Notebooks.
Data & Fabric: Microsoft Fabric Administration, Power BI Deployment.
Azure Architecture: Well-Architected Framework, Cost Optimization, Network Solutions.
Microsoft Azure
Research Interests & Submissions
Topics: Education Technology, Rural Energy Integration, Smart Grids, AI-Based Predictive Maintenance.
Engagements: Submissions and applications to platforms such as NSF, NRF, and the International Journal of Engineering and Technology Research (IJETR).
Digital Presence: Active portfolio on platforms like Internet Archive and GitHub.
NRF
NotebookLM


Bridging the Gap: A New Framework for Vocational Engineering Excellence in South Africa
A Case Study and Proposal for Integrating NATED & NCV Programs
Tshingombe Tshitadi Fiston
ATLANTIC INTERNATIONAL UNIVERSITY
NotebookLM

The Case of Tshingombe Tshitadi: A Dossier of Persistent Ambition and Systemic Friction

An evidence-based account of one individual's multi-year effort to achieve engineering qualification and professional employment in South Africa.

CASE FILE DETAILS

Subject: Tshingombe Tshitadi Fiston
ID: TIRCOG000910610
Field: Electrical Engineering (NATED Studies)
Period Under Review: 2019 - 2024
Status: Unresolved

UNRESOLVED

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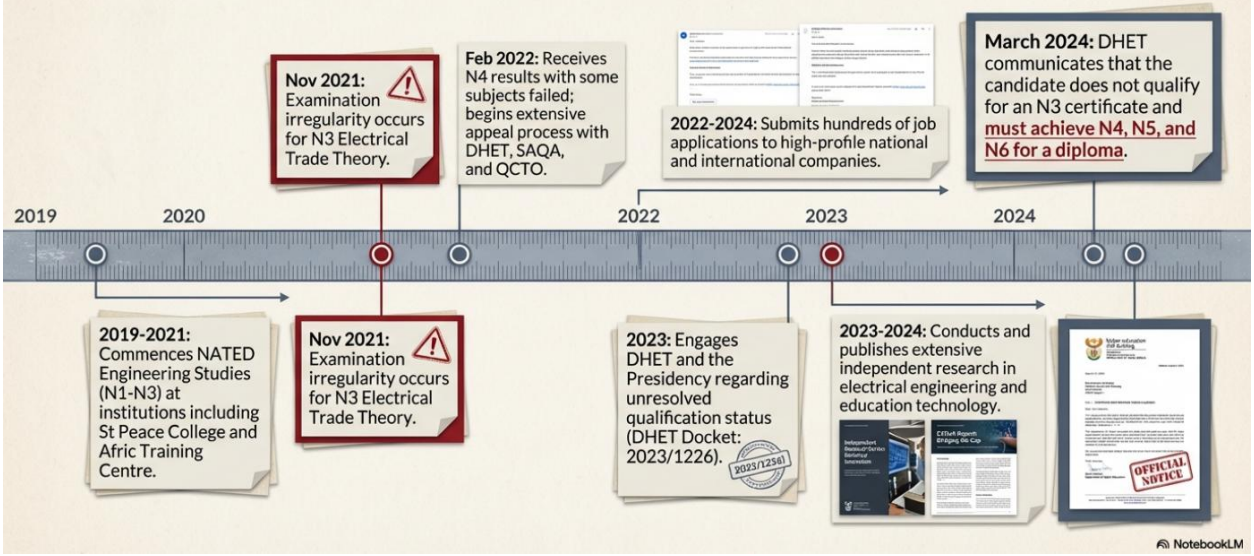
A Timeline of Unwavering Effort


2019
2020
2022
2023
2024
2019-2021: Commences NATED Engineering Studies (N1-N3) at institutions including St Peace College and Afric Training Centre.
Nov 2021: Examination irregularity occurs for N3 Electrical Trade Theory.
Nov 2021: Examination irregularity occurs for N3 Electrical Trade Theory.
Feb 2022: Receives N4 results with some subjects failed; begins extensive appeal process with DHET, SAQA, and QCTO.
2022-2024: Submits hundreds of job applications to high-profile national and international companies.
2023: Engages DHET and the Presidency regarding unresolved qualification status (DHET Docket: 2023/1226).
2023/1226
2023-2024: Conducts and publishes extensive independent research in electrical engineering and education technology.
March 2024: DHET communicates that the candidate does not qualify for an N3 certificate and must achieve N4, N5, and N6 for a diploma.
OFFICIAL NOTICE

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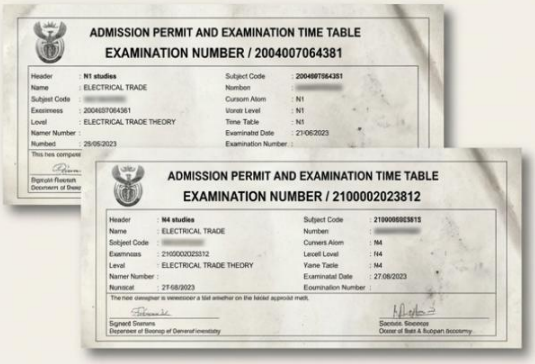
The Educational Foundation and the Point of Fracture

NATED Pathway Undertaken (N1-N6)

Institutions: St Peace College, Shalom Technical College, Afric Training Centre.

Key Subjects: Industrial Electronics, Electrical Trade Theory, Mathematics, Engineering Science, Electrotechnics (Levels N1-N4 cited).



ADMISSION PERMIT AND EXAMINATION TIME TABLE
EXAMINATION NUMBER / 2004007064381

ADMISSION PERMIT AND EXAMINATION TIME TABLE
EXAMINATION NUMBER / 2100002023812

The Critical Incident: Examination Irregularity

EXHIBIT A

"My motivation and disciplinary assessment submitted my portfolio... release result statement and finalized award diplomat by examination committed irregularity November invalide subject n3 trade theory electrical... the result of assessment was not release reason irregularity n3."

Official status from DHET records:

Subject Code	Subject	Level	Reason
N3	ELECTRICAL TRADE THEORY	N3	UNDER INVESTIGATION

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Navigating a Labyrinth of Appeals

dhet
Department
Higher Education Education
REPUBLIC & SOUTH AFRICA

Key Action: Formal appeal regarding N3 irregularity and non-issuance of certificates. (Docket Number: 2023/1226)

DHET Response (March 2024):
"Candidate does not qualify for an N3 certificate as he did not pass all subjects. For a candidate to be awarded with a diploma... they must achieve N4, N5 and N6 certificates plus relevant work experience."

SAQA
South African Qualifications Authority

Key Action: Submitted foreign qualification from DRC for evaluation (Ref: 201911130002) and sought guidance on N-Diploma pathway.

SAQA Response:
"SAQA accepted only qualifications official examination body country... external examination based."

Indicates non-compliance issues with submitted documents.

QCTO
Quality Council for Trades & Occupations

Key Action: Enquiries regarding certification and assessment.

QCTO Response:
"Please note that the QCTO does not issue any of results."

**Directs candidate back to DHET* ⬅

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An Unrelenting Pursuit of a Professional Career
While awaiting resolution on his qualifications, Mr. Tshingombe has submitted hundreds of applications for technical and engineering roles. This demonstrates a consistent and determined effort to enter the professional workforce.
Selected Job Titles Applied For:
• Software Engineer II (Microsoft)
• Data Center Technician (Microsoft)
• Cloud Engineer (SARB)
• Infrastructure Engineer (Met Police)
• Manufacturing Engineer (Ford)
• Specialist: Case Selection (SARS)
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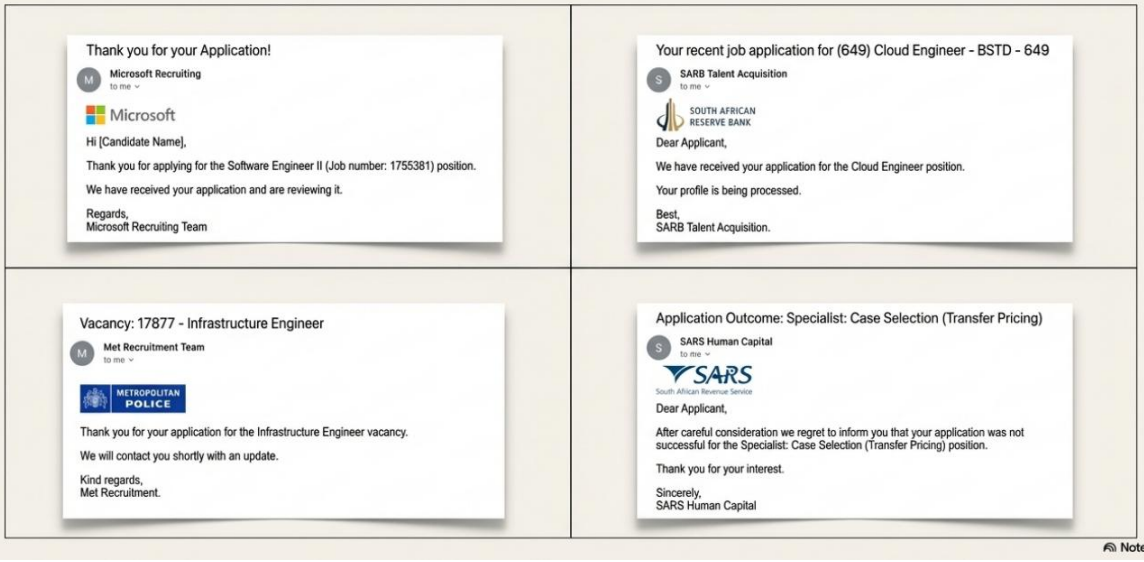
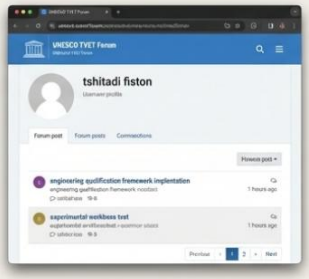
Exhibit B: The Digital Paper Trail of Applications


Thank you for your Application!
Microsoft Recruiting
to me
Microsoft
Hi [Candidate Name],
Thank you for applying for the Software Engineer II (Job number: 1755381) position.
We have received your application and are reviewing it.
Regards,
Microsoft Recruiting Team
Your recent job application for (649) Cloud Engineer - BSTD - 649
SARB Talent Acquisition
to me
SOUTH AFRICAN RESERVE BANK
Dear Applicant,
We have received your application for the Cloud Engineer position.
Your profile is being processed.
Best,
SARB Talent Acquisition.
Vacancy: 17877 - Infrastructure Engineer
Met Recruitment Team
to me
METROPOLITAN POLICE
Thank you for your application for the Infrastructure Engineer vacancy.
We will contact you shortly with an update.
Kind regards,
Met Recruitment.
Application Outcome: Specialist: Case Selection (Transfer Pricing)
SARS Human Capital
to me
SARS
South African Revenue Service
Dear Applicant,
After careful consideration we regret to inform you that your application was not successful for the Specialist: Case Selection (Transfer Pricing) position.
Thank you for your interest.
Sincerely,
SARS Human Capital
NotebookLM

Beyond the Curriculum: A Profile of a Self-Directed Engineer

Mr. Tshingombe's activities extend far beyond coursework and job applications. He is an active participant in technical communities, a consumer of specialized knowledge, and a creator of his own technical projects.

Community Engagement & Publications



- **Internet Archive:** Uploaded documents including "portofolio document st pace tshingombe" and "ccma labour court tshingombe job."

Professional Development

SABS: Records of online enquiries and orders related to "Trade engineering electrical research."

IEC (International Electrotechnical Commission): Quotation request for "IEC 62368-1:2023 Academy Masterclass."

Policing Project (NYU Law): Registration Registration for "Removing Barriers to Officer Accountability" webinar, demonstrating interest in systemic processes.

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A Glimpse into the Engineer's Notebook

The subject's personal notes reveal a deep exploration of advanced engineering concepts, from fundamental circuit theory to complex power systems and control logic.

Exhibit C: Theoretical Foundations

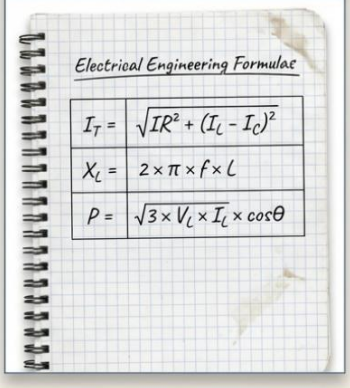


Exhibit D: Systems & Control Theory

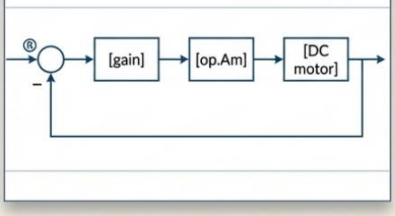


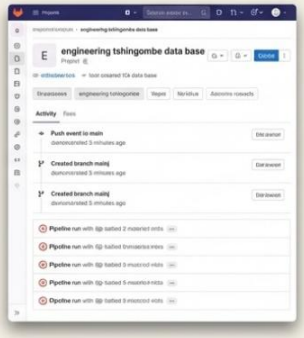
Exhibit E: Research Topics

- Smart Grid Power Systems & Cybersecurity
- Nanotechnology & Semiconductor Materials
- Power Harmonic Filter Analysis
- IoT-Enabled Electrical Systems
- Transformer Rewinding & Generator Stator Repair
- Machine Learning Models for Power Systems (Linear Regression)

Proving Ground: Modern Development & DevOps Practices

Mr. Tshingombe actively uses industry-standard platforms to manage his technical projects, demonstrating proficiency in version control, CI/CD pipelines, and cloud infrastructure.

Section 1: GitLab - Source Code & Project Management



- Repository activity log shows push events and merge requests.
- Evidence of CI/CD pipeline implementation (list of failed pipeline runs).
- Demonstrates use of branching strategies (`main`, `mainj`).

Section 2: Azure DevOps & Cloud Services

- Management of a project titled "thesis master atalantic azure."
- Engagement with cloud-hosted CI/CD platforms (Microsoft Azure Pipelines).

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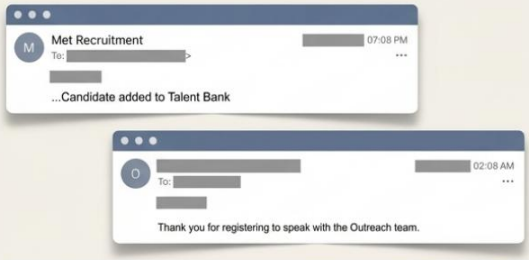
Engagement with Civic and Law Enforcement Systems

The subject's activities include extensive interaction with the Metropolitan Police Service (UK), demonstrating a pattern of systematic engagement with complex official bodies.

Employment & Outreach

Activity: Numerous applications for roles such as Infrastructure Engineer, Business Analyst, and retired officer schemes.

Evidence:


Met Recruitment
07:08 PM
...Candidate added to Talent Bank
02:08 AM
Thank you for registering to speak with the Outreach team.

Crime Reporting & Systemic Confusion

Activity: Submitted an online report to the police (Reference: MIP-482-24-0100-000).

System Response:

> "The crime reference number is showing in the system as **not in existence**. Are you the victim? What is the nature of the crime?"

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Case File Summary & Critical Questions

CASE STATUS: PENDING

Summary of Evidence

- **Educational Attainment:** N1-N6 coursework completed; N3 result remains "Under Investigation." National N-Diploma not awarded.
- **Professional Efforts:** Over 100 documented applications to major engineering, tech, and government employers. Rejection or no response is the common outcome.
- **Demonstrated Expertise:** Extensive portfolio of independent research, technical projects, and engagement with professional bodies in electrical engineering, control systems, and software development.
- **Systemic Engagement:** Methodical and persistent appeals filed with DHET, SAQA, and QCTO over a multi-year period with no definitive resolution.

Key Questions Raised

How can a candidate demonstrate years of consistent academic and technical effort yet remain formally unqualified due to a single, unresolved administrative issue?

What pathways exist for recognizing demonstrated, practical expertise when formal certification processes stall?

At what point does the burden of proof shift from the persistent individual to the systems responsible for their evaluation and accreditation?

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MIL-STD-100G vs. IEC 62368-1: A Guide for Ruggedized & Safety-Critical Systems

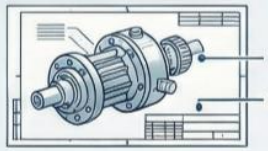
A comparison of the documentation-focused military standard (MIL-STD-100G) with the hazard-based international safety standard (IEC 62368-1) for engineers and compliance professionals.

MIL-STD-100G is a U.S. Department of Defense standard governing the creation and control of engineering drawings. IEC 62368-1 is an international standard focused on product safety through hazard identification and mitigation. Understanding the intersection is crucial for ruggedized and safety-critical systems.

MIL-STD-100G: The Documentation-Centric Approach

Focus on Structured Documentation & Control

Defines precise rules for engineering drawings, part numbers (PINs), and formats.

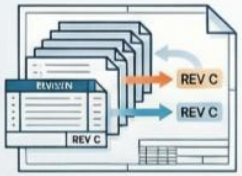


Safety Through Critical Item Identification

Manages safety by identifying and controlling Critical Safety Items (CSIs) on drawings.

Formalized Change & Configuration Management

Uses a rigid system of revision blocks and new PINs to track all changes.



IEC 62368-1:2024: The Hazard-Based Approach

Focus on Hazard-Based Safety Engineering (HBSE)

Identifies potential energy sources and requires safeguards to prevent injury.

Safety Through Energy Source Classification

Classifies energy sources (electrical, thermal, etc.) into three levels to mitigate harm.

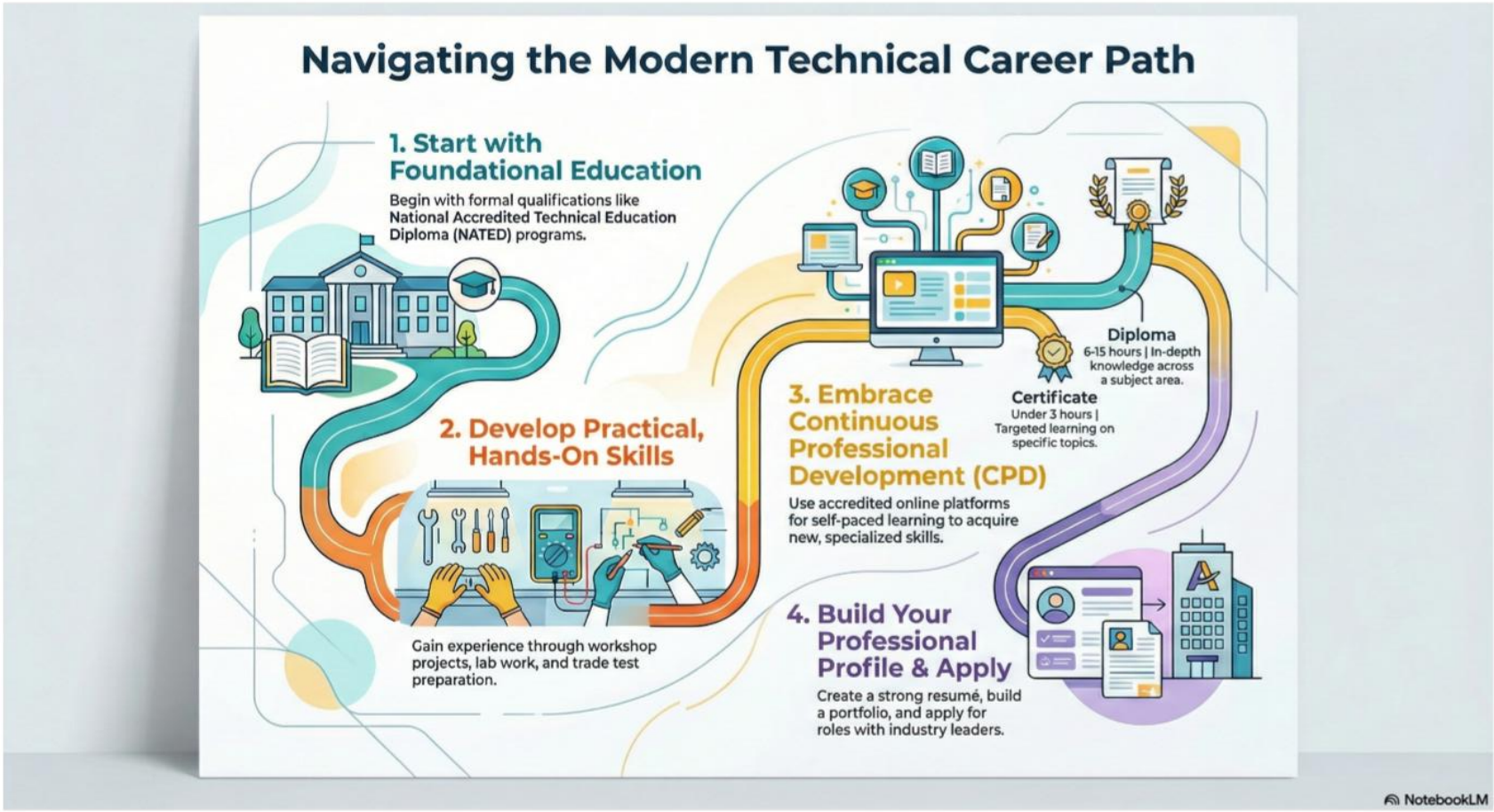
Changes Trigger Updated Risk Assessments

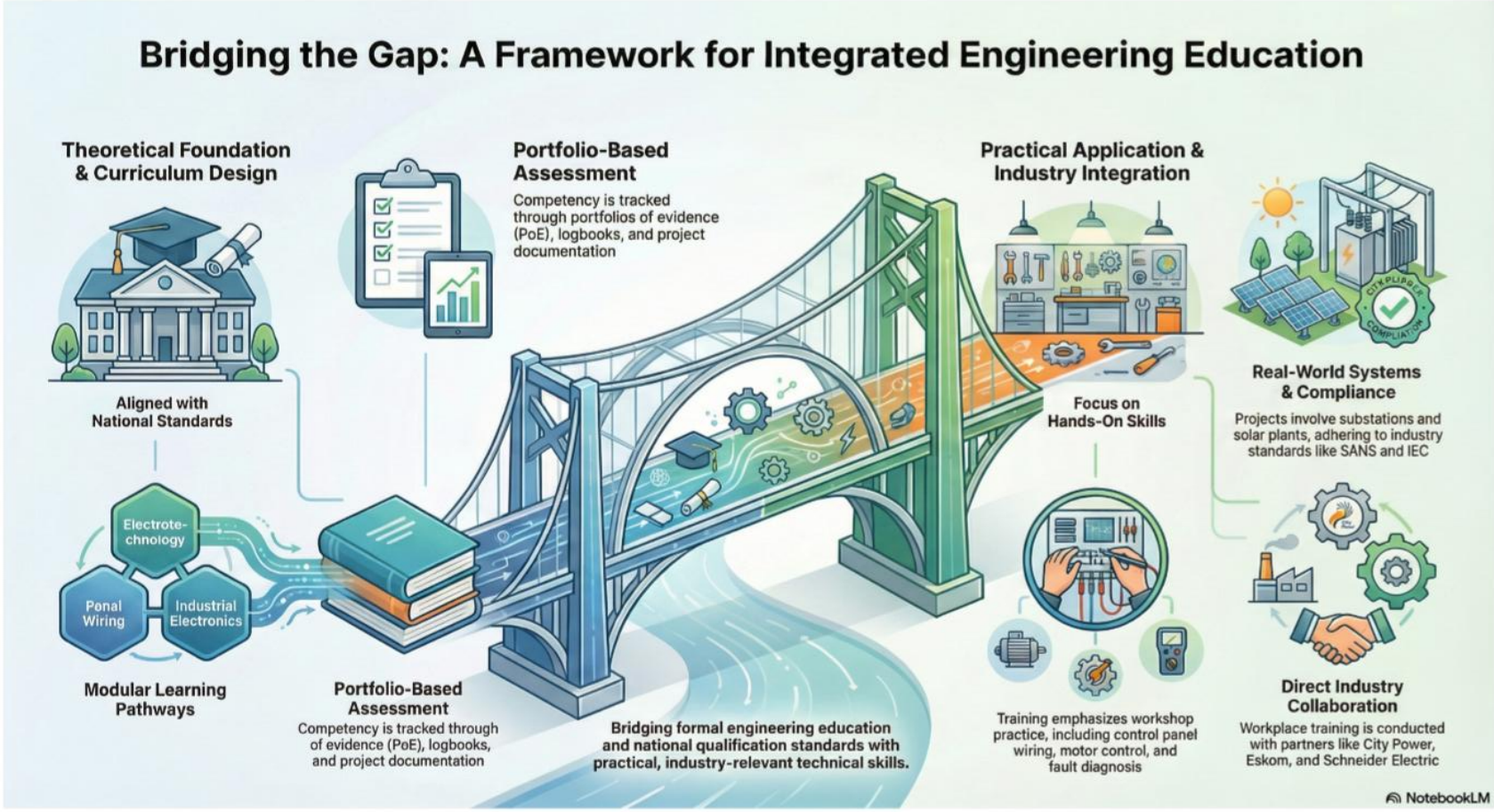
Requires a new risk assessment if any change could affect a product's safety.

CORE PHILOSOPHIES COMPARISON

MIL-STD-100G		IEC 62368-1:2024
DoD, government-unique, logistics support	Applicability	Global, commercial, AV/ICT equipment
Prescriptive, detailed formats (ASME Y14.100M)	Drawing Practices	Performance-based, documents safeguards
Critical Safety Items (CSIs) on drawings	Safety Focus	Hazard-based risk assessment, safeguards

NotebookLM


Navigating the Modern Technical Career Path
1. Start with Foundational Education
Begin with formal qualifications like National Accredited Technical Education Diploma (NATED) programs.
2. Develop Practical, Hands-On Skills
Gain experience through workshop projects, lab work, and trade test preparation.
3. Embrace Continuous Professional Development (CPD)
Use accredited online platforms for self-paced learning to acquire new, specialized skills.
Diploma
6-15 hours | In-depth knowledge across a subject area.
Certificate
Under 3 hours | Targeted learning on specific topics.
4. Build Your Professional Profile & Apply
Create a strong resumé, build a portfolio, and apply for roles with industry leaders.
NotebookLM


Bridging the Gap: A Framework for Integrated Engineering Education
Theoretical Foundation & Curriculum Design
Aligned with National Standards
Electrote-chnology
Ponal Wiring
Industrial Electronics
Modular Learning Pathways
Portfolio-Based Assessment
Competency is tracked through portfolios of evidence (PoE), logbooks, and project documentation
Portfolio-Based Assessment
Competency is tracked through of evidence (PoE), logbooks, and project documentation
Bridging formal engineering education and national qualification standards with practical, industry-relevant technical skills.
Practical Application & Industry Integration
Focus on Hands-On Skills
Training emphasizes workshop practice, including control panel wiring, motor control, and fault diagnosis
Real-World Systems & Compliance
Projects involve substations and solar plants, adhering to industry standards like SANS and IEC
Direct Industry Collaboration
Workplace training is conducted with partners like City Power, Eskom, and Schneider Electric
NotebookLM

Integrated Mastery: A Portfolio of Evidence in Engineering, Education, and Regulatory Compliance
Synthesizing Technical Depth, Quality Assurance, and Professional Resilience
Engineering
Assessment
Compliance
NotebookLM

Five Pillars of Competence
Foundational Engineering & Academic Rigor
The accredited NATED/SAQA qualification pathway, demonstrating a solid, verifiable educational base.
Bridging Theory with Industry Practice
Evidence of applying academic knowledge in real-world industrial settings.
Expertise in Assessment & Quality Assurance
Deep knowledge of national assessment policies and the practical application of moderation standards.
Resilience & Professional Advocacy
Proven capacity for navigating complex legal and administrative systems to ensure compliance and advocate for professional rights.
Mastery of Global & Future-Focused Standards
Command over international and corporate technical standards, demonstrating continuous learning and global relevance.
NotebookLM

Pillar 1: Foundational Engineering & Academic Rigor

Grounded in the South African National Qualifications Framework (NQF)

Qualification Title

National N Diploma in Engineering (SAQA ID: 90674, NQF Level: 6).

N1 → N2 → N3 → N4 → N5 → N6

Core Subjects

- Mathematics
- Engineering Science
- Electrical Trade Theory
- Industrial Electronics
- Electrotechnics
- Power Machines
- Control Systems
- Installation Rules

Visual Evidence

NotebookLM

A Detailed Look at Curriculum and Assessment Structure

ICASS Trimester Policy (Report 191)

Component	Weighting
Test 1	30%
Test 2	70%
Minimum to Qualify	40%
Validity	1 year

This structure ensures continuous assessment and syllabus coverage, forming the basis for examination entry.

Electrical Trade Theory N1 Module Weighting

Module	Weight Value (%)
DC theory	30
Wiring of premises	25
Magnetism and electromagnetism	10
Safety precautions	10
Other modules (Fire, Tools, etc.)	25

Demonstrates a curriculum heavily focused on foundational principles and practical application in wiring, governed by SANS 10142-1.

NotebookLM

Pillar 2: Bridging Theory with Industry Practice

Curriculum Validation and Portfolio Development at City Power Johannesburg

Objective

To align NATED Electrical Engineering studies with the operational realities of a major municipal utility.

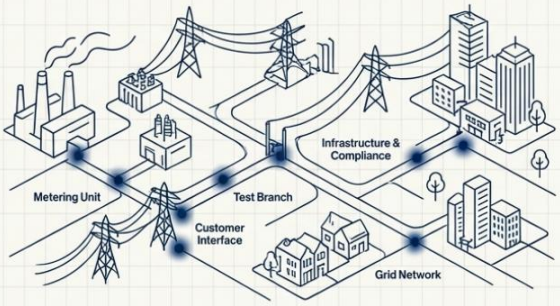
Key Activities

Job Shadowing: Observing technicians in Metering, Test Branch, and Customer Interface units.

Site Inspections: Assessing infrastructure and compliance with technical standards.

Curriculum Validation: Engaging with City Power staff to ensure syllabi reflect current industry needs.

Portfolio of Evidence (PoE): Collecting verified evidence for the National Trade Portfolio.



Key Insight: The visit confirms the challenges of the sector (e.g., load shedding, service delivery complaints) and reinforces the need for graduates who are not only technically skilled but also resilient and adaptable.

NotebookLM

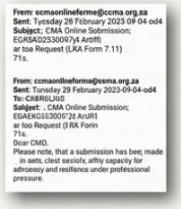
Pillar 4: Resilience & Professional Advocacy

A Proven Capacity for Navigating Complex Legal and Administrative Systems

This slide documents direct engagement with national statutory bodies as a demonstration of navigating formal systems to uphold professional and statutory rights.

Commission for Conciliation, Mediation and Arbitration (CCMA)

Engaged in formal dispute resolution processes regarding unfair dismissal claims.
(e.g., Case Ref GAJB6808-15).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Private Security Industry Regulatory Authority (PSIRA)

Filed formal complaints and engaged with the Private Security Sector Provident Fund regarding statutory obligations of employers.

LABOUR
SPECIAL COMPLAINT FORN-PRIVATE SECORITY SECTOR PROVIDENT FUND
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TSHNSOBBE CCMA

Labour Court & DOJ

Utilized formal legal channels for arbitration outcomes and civil case management.

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My Civil Cases

The Insight

This experience demonstrates a robust understanding of labour law, procedural fairness, and the mechanisms for legal recourse, showcasing a capacity for advocacy and resilience under professional pressure.

NotebookLM

Pillar 4: Resilience & Professional Advocacy

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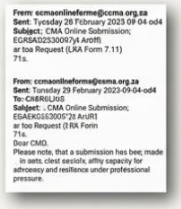
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My Civil Cases

The Insight

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NotebookLM

Pillar 3: Expertise in Assessment & Quality Assurance

Upholding National Standards as a Registered Assessor and Moderator

Role

Registered SETA Assessor and Moderator, responsible for ensuring assessment practices are fair, valid, and reliable.

Key Responsibilities

- **Internal Moderation:** Verify consistency of marking, review assessment tools, and provide feedback to assessors.
- **External Moderation:** Liaise with DHET and quality assurance bodies to ensure national consistency and credibility of qualifications.
- **PoE Management:** Ensure Portfolios of Evidence are comprehensive and meet regulatory requirements.

Governing Policies

All assessment practices are aligned with DHET guidelines, SAQA policies, and specific SETA requirements.

seta

This is to certify that

Tshingombe Tshitad

is a competent
ENGINEERING ASSESSOR
and **MODERATOR**
at NQF level 5

Authoized Signature

22 December 2024
Issue Date

Schneider Electric

NotebookLM

Pillar 5: Mastery of Global & Future-Focused Standards

Command of Mission-Critical U.S. Military & Defense Specifications

Featured Standard:: MIL-STD-11991B

General Standard for Parts, Materials, and Processes (PM&P)

Scope & Purpose

Defines requirements for managing PM&P across the entire lifecycle of military systems to ensure reliability, authenticity, and sustainment.

Key Concepts Mastered

- **Counterfeit Prevention:** Strong emphasis on authenticity, authorized suppliers, and Certificates of Conformance (C of C).
- **COTS Evaluation:** Provides criteria for assessing Commercial-Off-The-Shelf items for military use.
- **Derating:** The practice of using components below their maximum ratings to improve reliability.
- **Lifecycle Management:** Proactive management of component obsolescence.

The Insight

Expertise in these standards is critical for designing systems where failure is not an option, covering everything from counterfeit detection to corrosion prevention.

NotebookLM

Evidence of Application: Technical Data for High-Reliability Systems

Key Data Tables from MIL-STD-11991B for Audit-Ready Implementation

Table 1: PM&P Incoming Inspection Data Requirements (Appendix H)

Requirement	EEE parts	Mechanical parts	Notes
Database fields maintained for life	Yes	Yes	Lot date code, P.O. requirements, C of C data
Documented procedures for incoming tests	Yes	Yes	Define sampling, methods, acceptance criteria
Radiological inspection (X-ray)	Yes	Yes	Internal defects
DPA (Destructive Physical Analysis)	Required (one per lot)	—	See MIL-STD-1580
PIND (Particle Impact Noise Detection)	Categories A–C, T	—	Hermeticity/loose particles

Table 2: Microcircuit Derating Factors (Appendix A)

Critical Stress Parameter	Digital	Linear	Notes
Maximum Supply Voltage	0.90	0.80	Do not exceed 90% of max rating
Power Dissipation	0.80	0.75	Limit to 80% (digital), 75% (linear)
Max Junction Temperature	40°C below max	40°C below max	Applies across all devices

NotebookLM

Integrating Global Frameworks: A Comparative Analysis

Bridging Military Engineering Documentation (MIL-STD-100G) with International Safety Standards (IEC 62368-1:2024)

Dimension	MIL-STD-100G	IEC 62368-1:2024
Safety Focus	**Critical Safety Items (CSI):** Identifies specific components/characteristics requiring rigorous control.	**Hazard-Based Safety Engineering (HBSE):** Identifies energy sources and mandates safeguards.
Documentation	Prescriptive drawings identifying CSIs and requiring engineering evaluation of any changes.	Performance-based documentation of hazards, safeguards, and formal risk assessments.
Change Control	Formalized structure for numbering, identification (PINs, CAGE codes), and revision history.	Focus on the impact of changes on safety, requiring updated risk assessments.
Traceability	Achieved through PINs, CAGE codes, and government-controlled drawing revisions.	Achieved through critical component lists, test records, and supplier certifications.

Key Synthesis

For ruggedized and safety-critical systems, these approaches are complementary. MIL-STD-100G ensures traceability and control, while IEC 62368-1 ensures comprehensive hazard mitigation.

NotebookLM

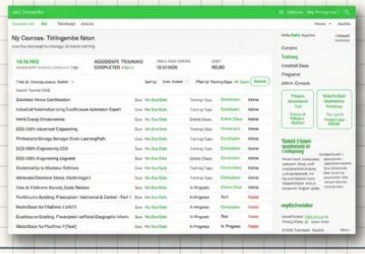
Continuous Professional Development in Modern Corporate Ecosystems

Microsoft

Certificate of Completion in **Engineering, Azure, GitHub**. Highlights proficiency in modern cloud and DevOps platforms. Over 943 modules and 756 training hours completed.

Schneider Electric

Active training in **EcoStruxure Automation Expert, Wind Energy Fundamentals,** and **Advanced Electrical Safety**. Demonstrates expertise in industrial automation and energy management.



EATON
CAREER AND UNIVERSITY

Profile review and skills assessment in **Stakeholder Communication**, demonstrating soft skills alongside technical expertise.

NotebookLM

Microsoft Learn Transcript: A Record of Continuous Upskilling

Over 940 Modules and 750 Hours of Advanced Technical Training

943
Modules Completed

216
Learning Paths Completed

756 hr 38 min
Training Hours Completed

Selected Learning Path Completions

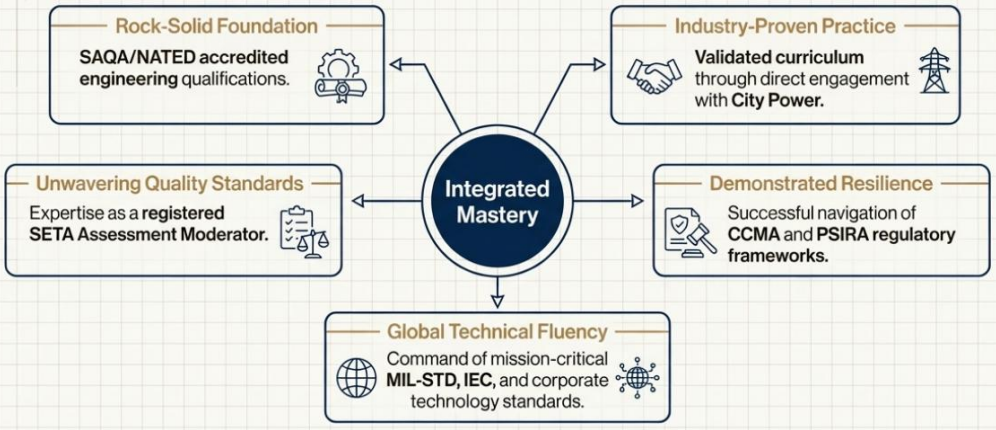
APL-2007: Accelerate app development by using GitHub Copilot
Learn how to accelerate app development by using GitHub Copilot and GitHub Copilot Chat in a Visual Studio Code environment. in Source Serif Pro Regular
Completed Oct 4, 2025

AI Fluency
A comprehensive understanding of AI fluency, from foundational concepts to advanced topics.
Completed Aug 28, 2025

Build custom agents for Microsoft Teams
Build custom agents for your Microsoft Teams environment for your business needs.
Completed Nov 16, 2024

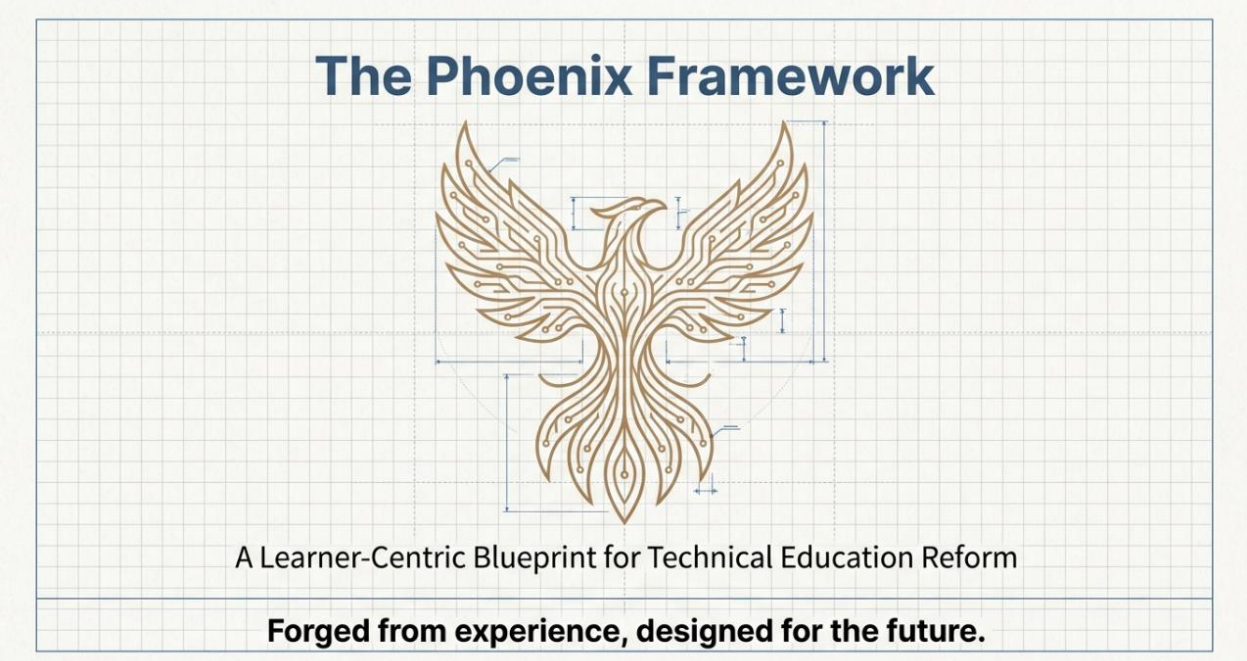
NotebookLM

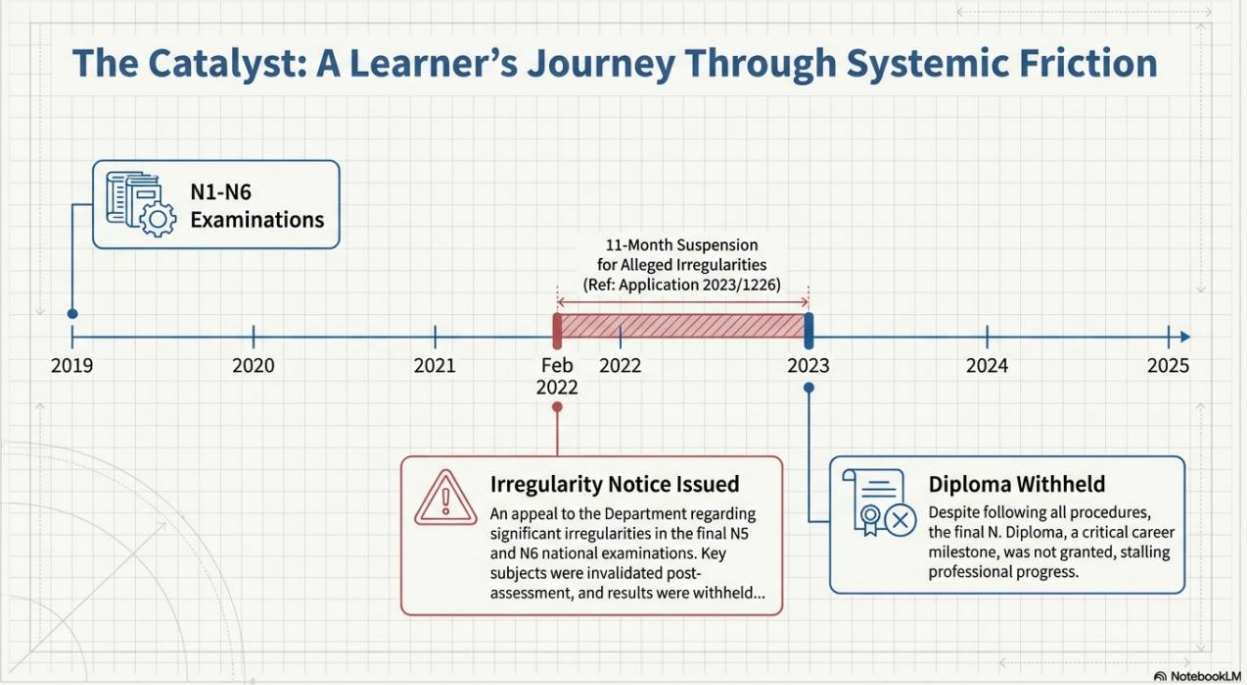
The Blueprint for Integrated Mastery

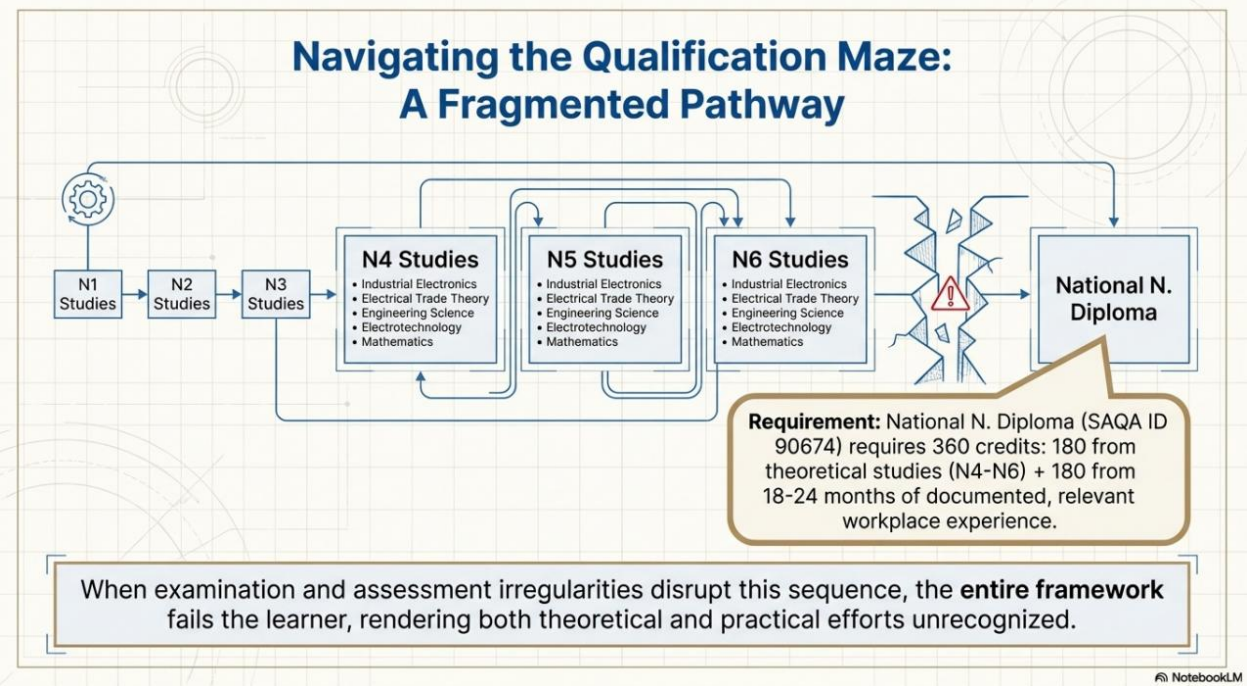

Rock-Solid Foundation
SAQA/NATED accredited engineering qualifications.
Industry-Proven Practice
Validated curriculum through direct engagement with City Power.
Integrated Mastery
Unwavering Quality Standards
Expertise as a registered SETA Assessment Moderator.
Demonstrated Resilience
Successful navigation of CCMA and PSIRA regulatory frameworks.
Global Technical Fluency
Command of mission-critical MIL-STD, IEC, and corporate technology standards.

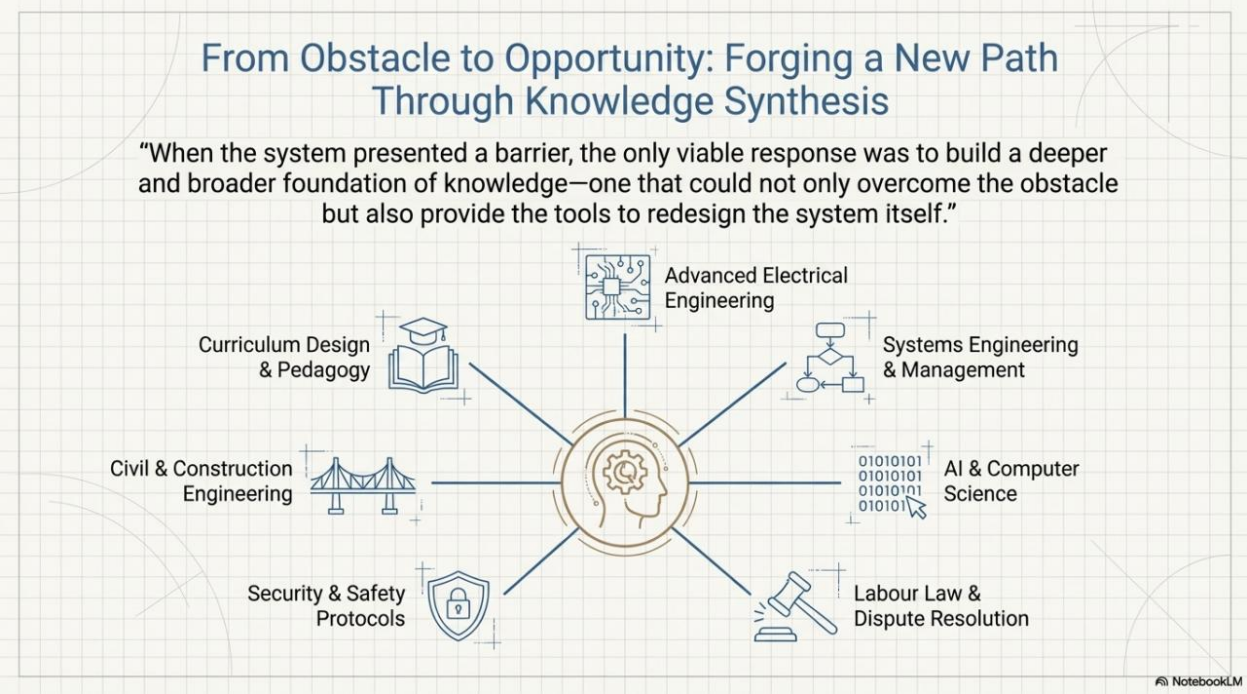
This portfolio demonstrates a rare synthesis of capabilities: the **technical precision** of an engineer, the **pedagogical rigor** of an educator, the strategic mindset of a **compliarte compliance expert**, and the resilience of a professional advocate. This is Integrated Mastery.

NotebookLM


The Phoenix Framework
A Learner-Centric Blueprint for Technical Education Reform
Forged from experience, designed for the future.
NotebookLM


The Catalyst: A Learner's Journey Through Systemic Friction
N1-N6 Examinations
11-Month Suspension for Alleged Irregularities (Ref: Application 2023/1226)
2019
2020
2021
Feb 2022
2022
2023
2024
2025
Irregularity Notice Issued
An appeal to the Department regarding significant irregularities in the final N5 and N6 national examinations. Key subjects were invalidated post-assessment, and results were withheld...
Diploma Withheld
Despite following all procedures, the final N. Diploma, a critical career milestone, was not granted, stalling professional progress.
NotebookLM


Navigating the Qualification Maze:
A Fragmented Pathway
N1 Studies
N2 Studies
N3 Studies
N4 Studies
• Industrial Electronics
• Electrical Trade Theory
• Engineering Science
• Electrotechnology
• Mathematics
N5 Studies
• Industrial Electronics
• Electrical Trade Theory
• Engineering Science
• Electrotechnology
• Mathematics
N6 Studies
• Industrial Electronics
• Electrical Trade Theory
• Engineering Science
• Electrotechnology
• Mathematics
National N. Diploma
Requirement: National N. Diploma (SAQA ID 90674) requires 360 credits: 180 from theoretical studies (N4-N6) + 180 from 18-24 months of documented, relevant workplace experience.
When examination and assessment irregularities disrupt this sequence, the entire framework fails the learner, rendering both theoretical and practical efforts unrecognized.
NotebookLM


From Obstacle to Opportunity: Forging a New Path Through Knowledge Synthesis
"When the system presented a barrier, the only viable response was to build a deeper and broader foundation of knowledge—one that could not only overcome the obstacle but also provide the tools to redesign the system itself."
Advanced Electrical Engineering
Curriculum Design & Pedagogy
Systems Engineering & Management
Civil & Construction Engineering
AI & Computer Science
Security & Safety Protocols
Labour Law & Dispute Resolution
NotebookLM

A Universe of Disciplines: Building a Holistic Expertise

Electrical Engineering
- Power System Analysis
- Symmetrical Faults
- AC/DC Machines
- RLC Circuits
- Transformer Design
- SANS 10142

AI & Computer Science
- Mathematics for AI
- Recursive Data Types
- State Machines
- The Halting Problem
- Number Theory
- RSA Public Key Encryption
- Logic Formulas

Systems Engineering
- Requirements Analysis
- Functional Allocation
- Design Synthesis
- Work Breakdown Structures
- Configuration Management
- MIL-STD standards

Law & Regulation
- Labour Relations Act (LRA)
- CCMA Processes
- Pension Funds Act
- Mine Health & Safety Act
- Firearms Control Act
- Private Security Industry Regulation Act (PSIRA)

Security & Policing
- Criminal Investigation
- Access Control (CCTV)
- Crime Scene Management
- Corporate Investigation
- Security Risk Assessment

Education & Pedagogy
- Curriculum Design
- Assessment Modeling
- NQF/SAQA Policy
- Facilitation
- Recognition of Prior Learning (RPL)
- CPD Frameworks

NotebookLM

Grounded in First Principles: A Deep Dive into Engineering Calculations

Formulas

DC Machines

Speed $N = \frac{V - I_a \cdot R}{K \cdot \Phi}$

Torque $T = K \cdot \Phi \cdot I_a$

RLC Circuits

Impedance $Z = \sqrt{[R^2 + (X_L - X_C)^2]}$

Power Factor

$PF = \frac{P}{S}$ (Ratio of Real Power to Apparent Power)

Derivatives in Signal Analysis

df/dx for partial derivatives

DF for total derivatives

Integrals for Energy

$Q = \int I(t)\, dt$ to calculate total charge

Application & Standards

Fault Calculation

Breakers calculated on a symmetrical current rating based on X/R ratio.

System Design

Design a distribution system.
Development of a system one-line.

Regulatory Compliance

Referencing standards like ANSI/IEEE C37.13, NPA 70-2014, and SANS 10142.

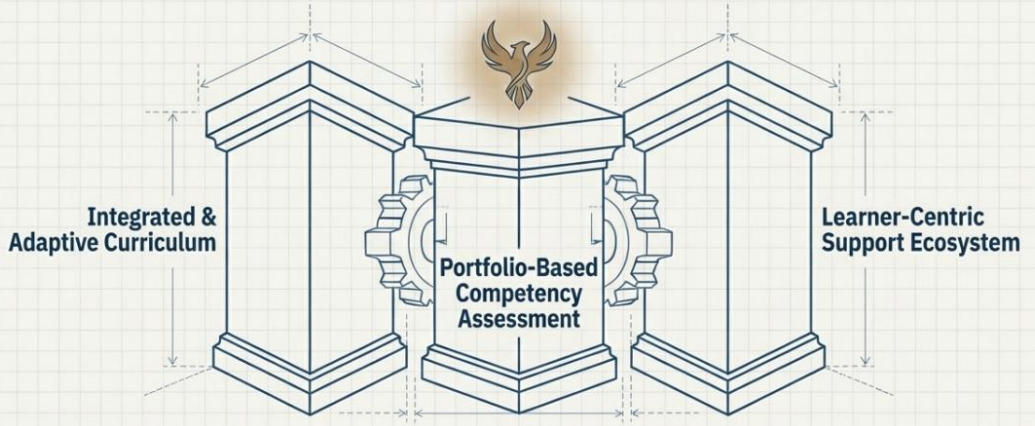
13.8 kV System & Transformer Analysis

System Component	X	R	X/R
13.8 kV System	0.98%	0.066%	15
Transformer	5.05%	0.65%	8
System Total	6.04%	0.716%	8

NotebookLM

The Synthesis: Introducing the Phoenix Framework for Technical Education

The Phoenix Framework is an integrated educational model designed to bridge the gap between theoretical knowledge, practical competency, and regulatory recognition. It is the direct outcome of synthesizing deep, multi-disciplinary expertise to solve the systemic frictions that hinder skilled learners.



NotebookLM

Pillar 1: An Integrated and Adaptive Curriculum

Key Principles

Multi-disciplinary by Design: Fuses core technical subjects (e.g., Electrotechnics) with essential contextual domains (e.g., Labour Law, Systems Management, Safety Compliance).

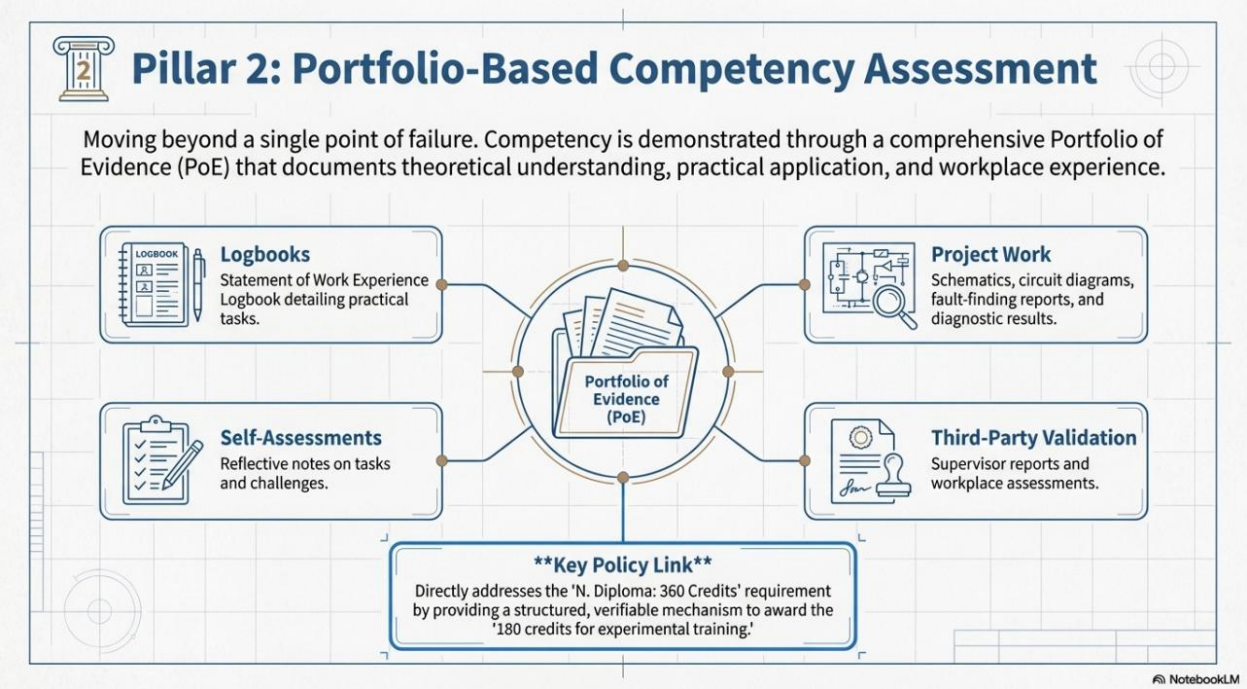
Industry-Aligned Modules: Curriculum content is directly mapped to occupational functions and industry standards (e.g., SANS, OHS Act).

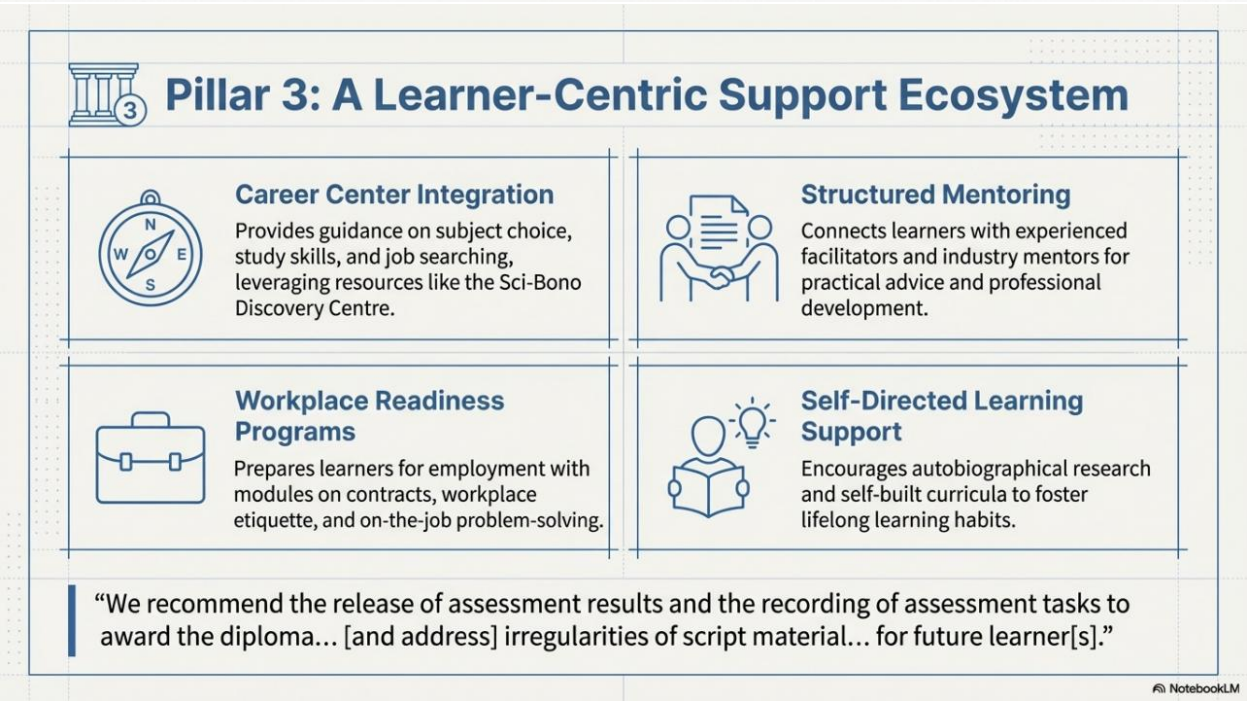
Adaptive Learning Pathways: Allows for specialization while maintaining a strong foundational core, enabling learners to pursue paths in Engineering, Security, or Management.

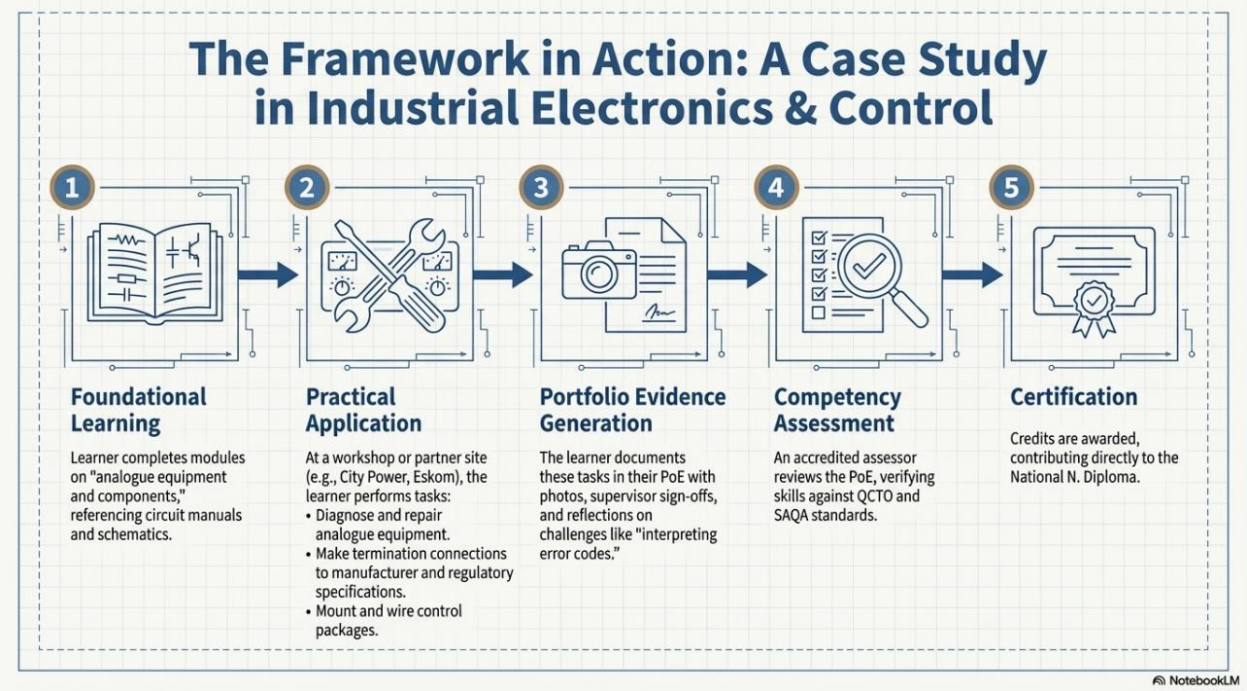
Sample Curriculum Structure

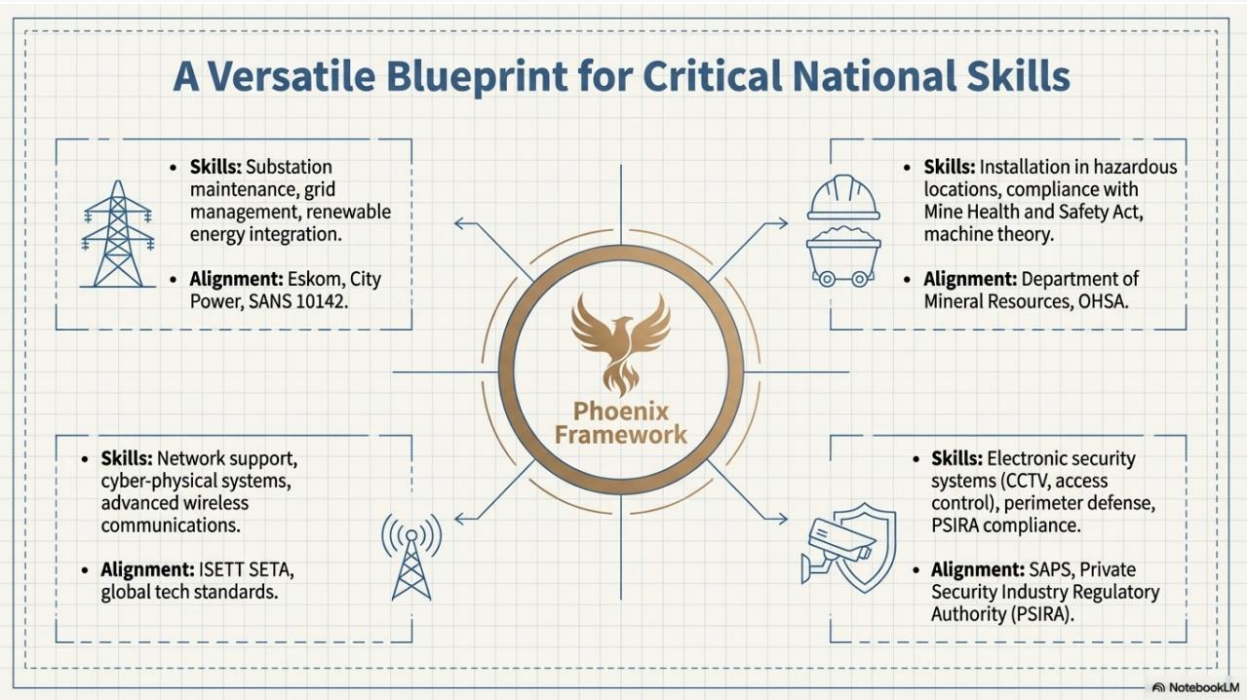
Course Title	Course Objectives	Course Description	Activity to carry out
Advanced Electrical Engineering in Construction and Civil Engineering	To integrate electrical systems within modern construction projects and understand sustainable energy solutions.	This course provides an in-depth understanding of electrical engineering principles and their applications in construction and civil engineering.	Analyze and design an electrical distribution system for a multi-story commercial building, ensuring compliance with SANS 10142.

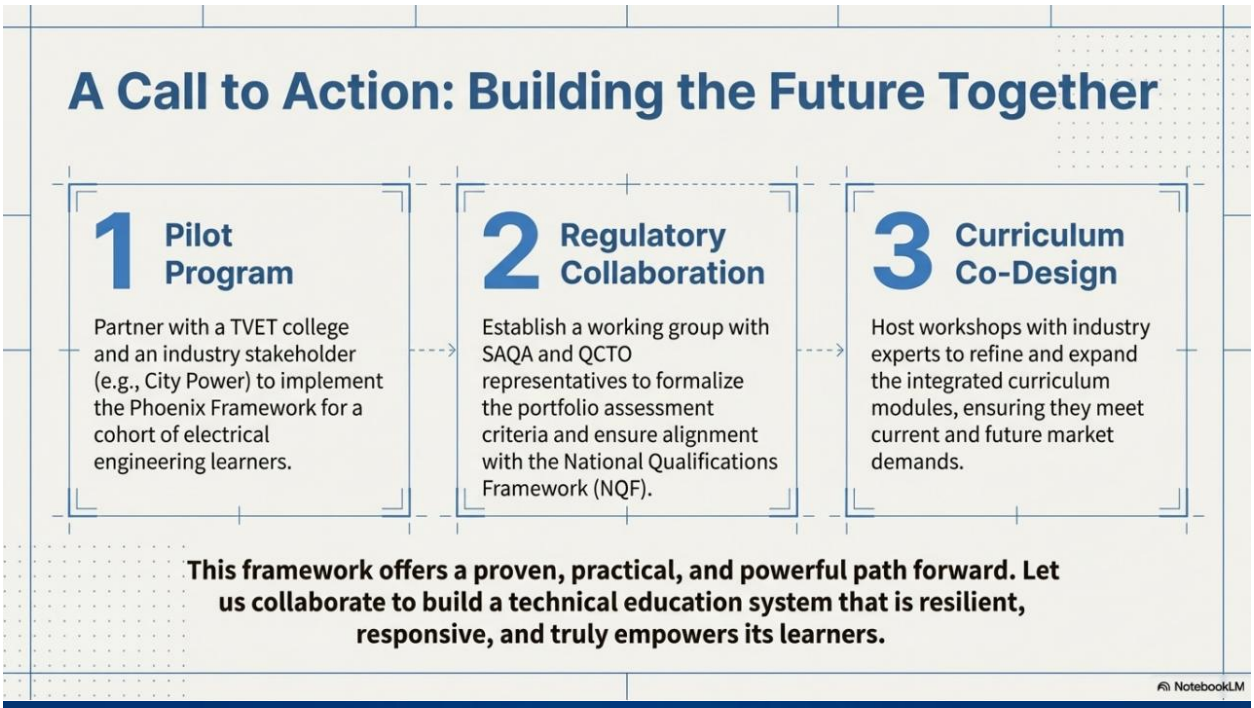
NotebookLM


Pillar 2: Portfolio-Based Competency Assessment
Moving beyond a single point of failure. Competency is demonstrated through a comprehensive Portfolio of Evidence (PoE) that documents theoretical understanding, practical application, and workplace experience.
Logbooks
Statement of Work Experience Logbook detailing practical tasks.
Project Work
Schematics, circuit diagrams, fault-finding reports, and diagnostic results.
Portfolio of Evidence (PoE)
Self-Assessments
Reflective notes on tasks and challenges.
Third-Party Validation
Supervisor reports and workplace assessments.
Key Policy Link
Directly addresses the 'N. Diploma: 360 Credits' requirement by providing a structured, verifiable mechanism to award the '180 credits for experimental training.'
NotebookLM


Pillar 3: A Learner-Centric Support Ecosystem
Career Center Integration
Provides guidance on subject choice, study skills, and job searching, leveraging resources like the Sci-Bono Discovery Centre.
Structured Mentoring
Connects learners with experienced facilitators and industry mentors for practical advice and professional development.
Workplace Readiness Programs
Prepares learners for employment with modules on contracts, workplace etiquette, and on-the-job problem-solving.
Self-Directed Learning Support
Encourages autobiographical research and self-built curricula to foster lifelong learning habits.
"We recommend the release of assessment results and the recording of assessment tasks to award the diploma... [and address] irregularities of script material... for future learner[s]."
NotebookLM


The Framework in Action: A Case Study in Industrial Electronics & Control
1
2
3
4
5
Foundational Learning
Learner completes modules on "analogue equipment and components," referencing circuit manuals and schematics.
Practical Application
At a workshop or partner site (e.g., City Power, Eskom), the learner performs tasks:
• Diagnose and repair analogue equipment.
• Make termination connections to manufacturer and regulatory specifications.
• Mount and wire control packages.
Portfolio Evidence Generation
The learner documents these tasks in their PoE with photos, supervisor sign-offs, and reflections on challenges like "interpreting error codes."
Competency Assessment
An accredited assessor reviews the PoE, verifying skills against QCTO and SAQA standards.
Certification
Credits are awarded, contributing directly to the National N. Diploma.
NotebookLM

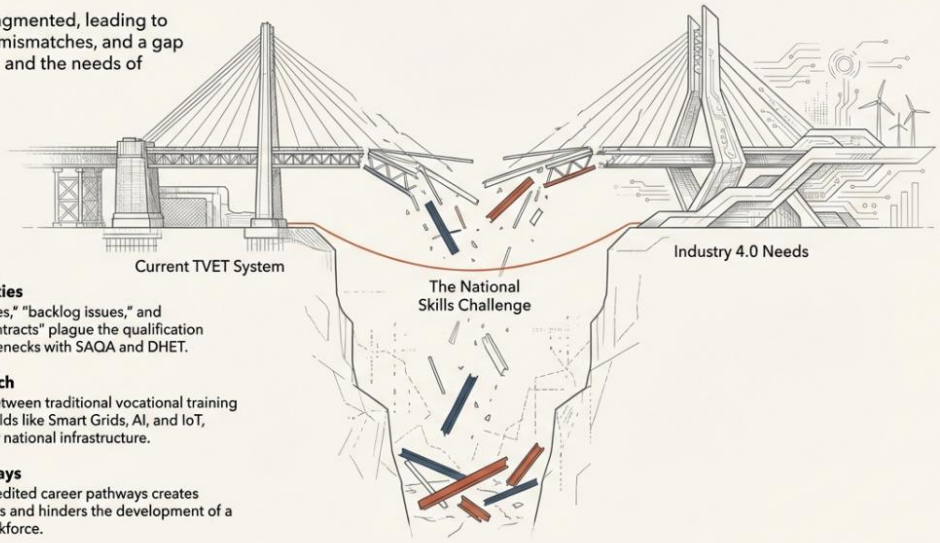

A Versatile Blueprint for Critical National Skills
• Skills: Substation maintenance, grid management, renewable energy integration.
• Alignment: Eskom, City Power, SANS 10142.
• Skills: Installation in hazardous locations, compliance with Mine Health and Safety Act, machine theory.
• Alignment: Department of Mineral Resources, OHSA.
Phoenix Framework
• Skills: Network support, cyber-physical systems, advanced wireless communications.
• Alignment: ISETT SETA, global tech standards.
• Skills: Electronic security systems (CCTV, access control), perimeter defense, PSIRA compliance.
• Alignment: SAPS, Private Security Industry Regulatory Authority (PSIRA).
NotebookLM


A Call to Action: Building the Future Together
1 Pilot Program
Partner with a TVET college and an industry stakeholder (e.g., City Power) to implement the Phoenix Framework for a cohort of electrical engineering learners.
2 Regulatory Collaboration
Establish a working group with SAQA and QCTO representatives to formalize the portfolio assessment criteria and ensure alignment with the National Qualifications Framework (NQF).
3 Curriculum Co-Design
Host workshops with industry experts to refine and expand the integrated curriculum modules, ensuring they meet current and future market demands.
This framework offers a proven, practical, and powerful path forward. Let us collaborate to build a technical education system that is resilient, responsive, and truly empowers its learners.
NotebookLM

The Blueprint is Ready.
A system that recognizes potential, validates experience, and builds the future. One learner at a time.
NotebookLM

South Africa's Technical Education Is at a Crossroads

The current framework is fragmented, leading to qualification backlogs, skill mismatches, and a gap between NATED curriculum and the needs of Industry 4.0.



Systemic Irregularities
Persistent "irregularities," "backlog issues," and "non-performance contracts" plague the qualification system, creating bottlenecks with SAQA and DHET.

Curriculum Mismatch
A critical gap exists between traditional vocational training and future-focused fields like Smart Grids, AI, and IoT, which are essential for national infrastructure.

Fragmented Pathways
The lack of clear, accredited career pathways creates uncertainty for learners and hinders the development of a technically skilled workforce.

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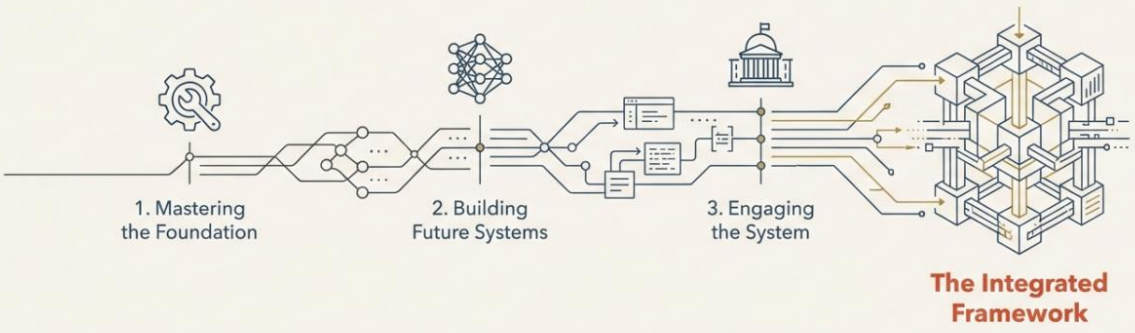
Forging a New Path: An Integrated Framework for Engineering Excellence

To solve this challenge, a multi-year journey was undertaken to master foundational skills, build future-ready systems, and engage the regulatory landscape. The result is a cohesive framework that bridges theory, practice, and compliance.



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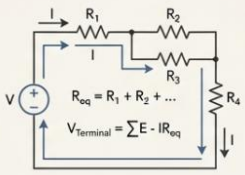
The Journey, Part 1: Mastering the Foundation

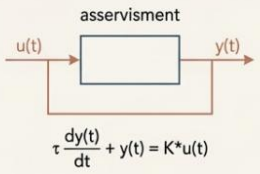
Deep Expertise in Foundational Electrical Engineering and Trade Skills

Key Competencies

- **Electrical Trade Theory**
  Mastery of core principles including Ohm's Law, AC/DC circuits, and power factor correction.
- **Industrial Electronics**
  Application of semiconductor devices (diodes, thyristors, SCRs) in control systems.
- **Practical Workshop Skills**
  Proficient in workshop practices including drilling, grinding, welding, and fabrication.
- **Fault Analysis & Panel Wiring**
  Expertise in diagnosing and correcting faults in control panels, distribution boards, and motor control circuits.

Evidence Showcase





MERSETA framework checklist:

- ✓ Use fixed and portable drilling machines
- ✓ Sharpen drills
- ✓ Prepare material for arc weld
- ✓ Tack and arc weld work piece

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The Journey, Part 2: Building Future Systems

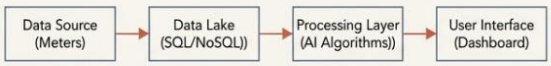
Integrating Advanced Concepts for Industry 4.0 and Smart Infrastructure

Key Competencies

- "Artificial General Intelligence (AGI): Exploring AGI's role in human-machine collaboration, its societal impact, and its contrast with narrow AI.
- "Smart Grids & IoT: Understanding real-time data collection, predictive maintenance for electric meters, and IoT applications in power systems.
- "Cybersecurity & Hacking: Principles of network security, including SSL/TLS protocols, threat analysis (POODLE, Heartbleed), and data protection.
- "Renewable Energy Systems: Exploring solar, wind, and hydro energy conversion, system efficiency, and e-commerce strategies for the renewable sector.

Evidence Showcase

- AGI in Human-Machine Collaboration
- Smart Grids and IoT Applications
- Cybersecurity and Hacking
- Online Retail and E-commerce in the Renewable Energy Sector



- CRISPR
- Blockchain Consensus Mechanisms
- Robotic Process Automation (RPA)

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The Journey, Part 3: Engaging the System

Proactively Navigating the Regulatory and Funding Landscape to Drive Reform

Key Engagements

- **"Qualification Development"**
  Formal submission to the Quality Council for Trades & Occupations (QCTO) to develop and realign the 'Engineering Electrical Trade Theory N4' qualification, addressing systemic gaps.
- **"National Funding Proposals"**
  Application to the National Skills Fund (NSF) for an 'Engineering Electrical N4,5,6 Assessment Policy Implementation' project, targeting youth unemployment and skill development.
- **"Research & Development Incentives"**
  Successful application for the DSI R&D Tax Incentive program for a project in 'Engineering Electrical,' linking innovation to fiscal policy.
- **"Labour Relations & Compliance"**
  Deep analysis of labour law, including the Labour Relations Act (LRA), CCMA processes, and private security sector bargaining council agreements, to ensure frameworks are legally sound.

Evidence Showcase

QCTO Application for Qualification Development: Engineering Electrical Trade Theory N4.

NSF Project Proposal: Engineering Electrical N4,5,6 Assessment Policy Implementation.
Project Duration: 24 months.

DSI R&D Tax Incentive Notification of Approval.
Registration No: 2013/034490/07.

- Labour Relations Act 66 of 1995
- Basic Conditions of Employment Act
- CCMA rules

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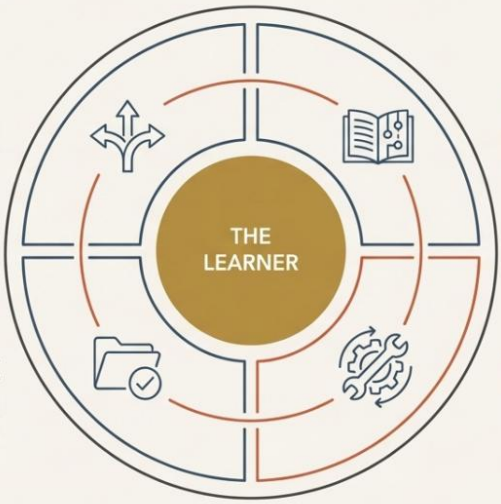
The Solution: An Integrated Framework for Technical and Vocational Excellence

The Tshingombe Integrated Framework is a holistic, multi-layered model that synthesizes foundational theory, advanced concepts, practical application, and regulatory compliance into a single, cohesive educational pathway.



4. The Career Pathway Integration
Connecting Learning to Industry & Lifelong Growth

1. The Didactic Core
Blending Foundational & Future-Ready Knowledge

3. The Assessment & Compliance Layer
Ensuring Credentialed, Portfolio-Based Validation

2. The Practical Engine
Driving Hands-On, Project-Based Mastery

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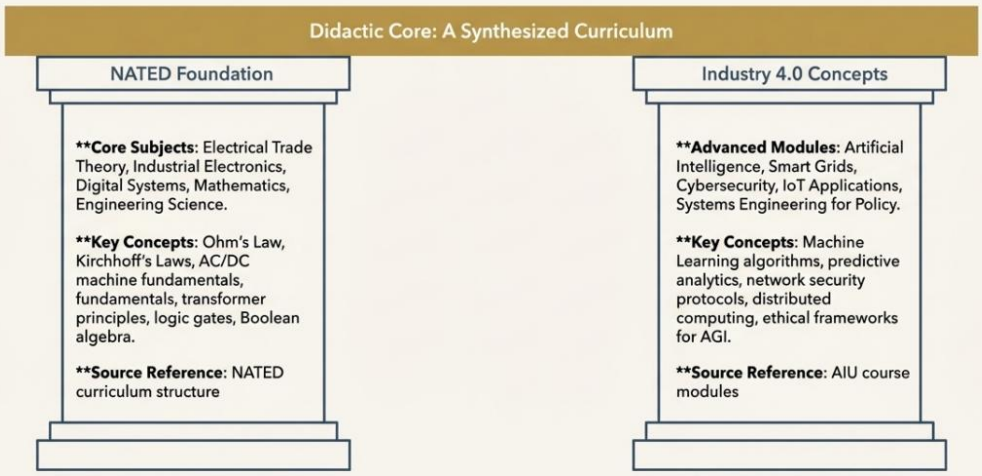
Framework Component 1: The Didactic Core

A Curriculum Blending Foundational NATED Theory with Advanced Systems Thinking


Didactic Core: A Synthesized Curriculum
NATED Foundation
Core Subjects: Electrical Trade Theory, Industrial Electronics, Digital Systems, Mathematics, Engineering Science.
Key Concepts: Ohm's Law, Kirchhoff's Laws, AC/DC machine fundamentals, fundamentals, transformer principles, logic gates, Boolean algebra.
Source Reference: NATED curriculum structure
Industry 4.0 Concepts
Advanced Modules: Artificial Intelligence, Smart Grids, Cybersecurity, IoT Applications, Systems Engineering for Policy.
Key Concepts: Machine Learning algorithms, predictive analytics, network security protocols, distributed computing, ethical frameworks for AGI.
Source Reference: AIU course modules

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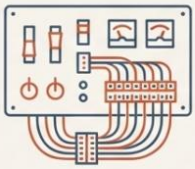
Framework Component 2: The Practical Engine

Project-Based Learning Rooted in Workshop Mastery and Real-World Application

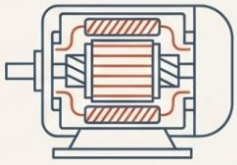
Workshop Fabrication & Assembly

- Fabricate a project to within ±0,25 mm dimensional tolerance.
- Sharpen drill angles according to material application.
- Prepare and execute manual metal arc welding and gas welding.



Control Panel Wiring & Testing

- Mount, wire, and connect switch boards, distribution boards, and motor controls.
- Fault-find on control panels for open circuits, short circuits, and single-phase faults.



AC/DC Machine Configuration

- Design and wire circuits for single-phase capacitor start motors (forward and reverse).
- Connect, test, and fault-find on DC series, shunt, and compound motors.

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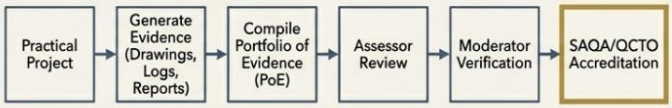
Framework Component 3: The Assessment & Compliance Layer

A Portfolio-Based Assessment System Aligned with SAQA and QCTO Standards

Core Principles:

- **Outcome-Based Evaluation:** Assessment is based on demonstrated competence ("analysing a problem," "design a solution," "testing and reporting"), not just theoretical knowledge.
- **Portfolio of Evidence (PoE):** Learners compile a comprehensive PoE including project reports, schematics, fault-finding logs, and supervisor testimonials.
- **Assessor & Moderator Framework:** Utilizes trained assessors to ensure evaluation is Authentic, Valid, Current, and Sufficient.
- **NQF Level Alignment**: All outcomes are explicitly mapped to the South African National Qualifications Framework (NQF) levels for national recognition.



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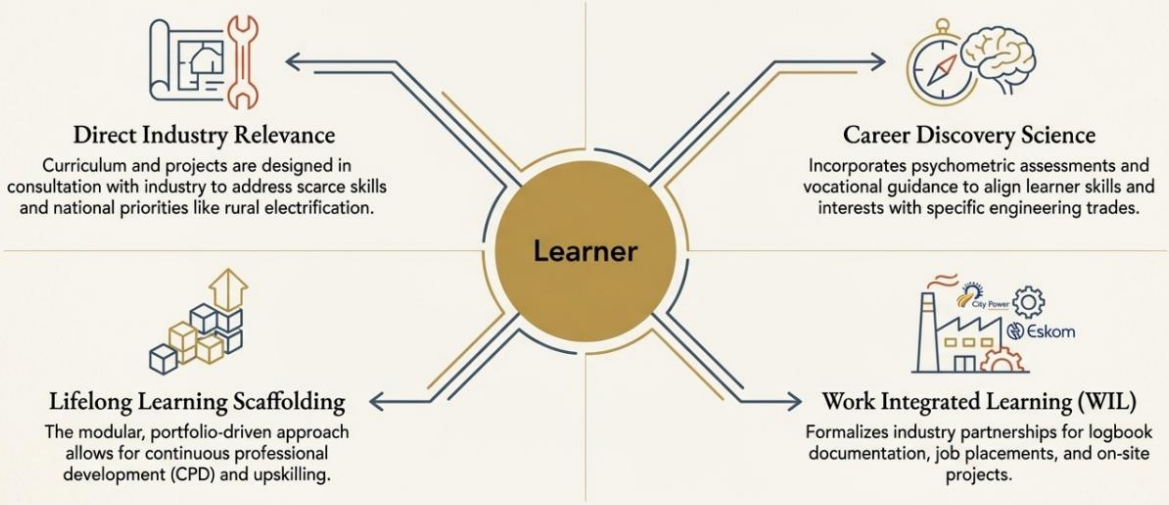
Framework Component 4: The Career Pathway Integration

Connecting Education to Career Discovery and Industry Needs


Learner
Direct Industry Relevance
Curriculum and projects are designed in consultation with industry to address scarce skills and national priorities like rural electrification.
Career Discovery Science
Incorporates psychometric assessments and vocational guidance to align learner skills and interests with specific engineering trades.
Lifelong Learning Scaffolding
The modular, portfolio-driven approach allows for continuous professional development (CPD) and upskilling.
Work Integrated Learning (WIL)
Formalizes industry partnerships for logbook documentation, job placements, and on-site projects.
City Power
Eskom

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The Vision: Impact and Implementation

Powering the Future: A Case Study in Rural Electrification

Project Abstract:
Application of the integrated framework to address the challenge of rural electrification in South Africa, where a backlog of 3.4 million households exists.

Problem Analysis:
- Total rural unelectrified population = **10.0 million**
- Calculation: 52.89 million × 0.31 × 0.62

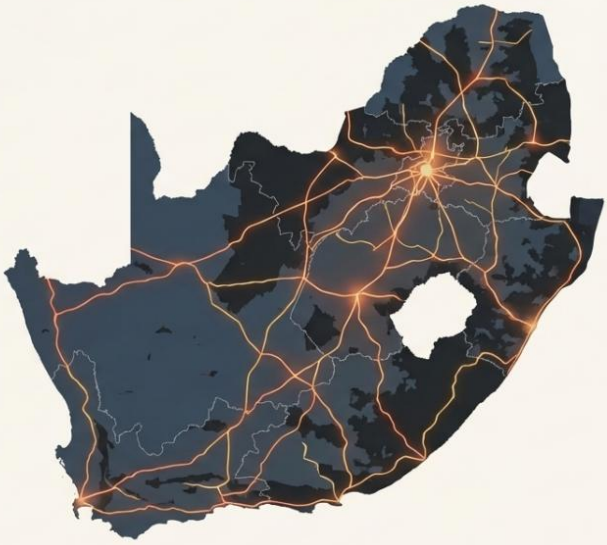
Solution Design:
Proposes the use of grid, off-grid, and PV-based hybrid systems, requiring skilled technicians for installation and maintenance.

System Calculations Showcase:

$$\text{Demand Factor} = \frac{\text{Maximum Demand}}{\text{Connected Load}}$$

$$\text{Load Factor} = \frac{\text{Average Load}}{\text{Maximum Load}}$$

Real Power (3-phase): $P = \sqrt{3} \times V_c \times I_c \times \cos(\theta)$



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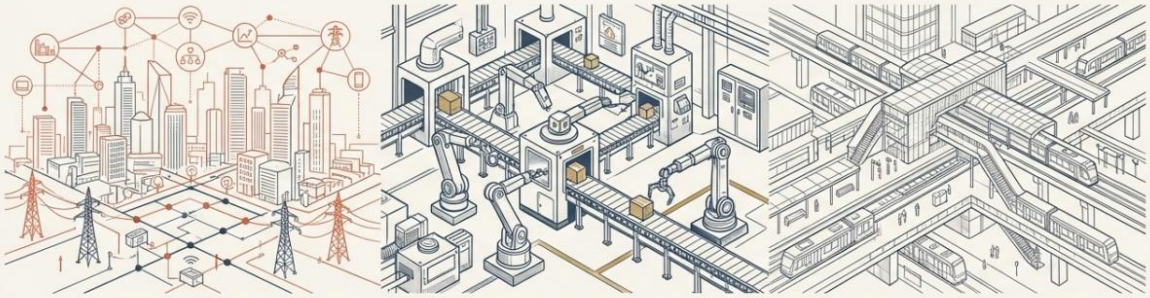
Building a Generation of Future-Ready Engineers to Strengthen National Infrastructure



Creating a Skilled Workforce

Graduates possess the verified skills to design, build, and maintain critical infrastructure, from smart grids and traffic management systems to industrial automation.

Enhancing Economic Competitiveness

By closing the skills gap, the framework supports the Industrial Policy Action Plan and strengthens local manufacturing and technology sectors.

Setting a New Benchmark for TVET

Establishes a model for excellence in technical education that is integrated, compliant, and responsive to the needs of the 21st-century economy.

"Engineering has existed since ancient times...exploiting basic mechanical principle to develop useful tools object. This framework continues that legacy for the digital age."

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A Foundation of Rigorous Research, Curriculum Design, and Intellectual Property

Selected Curriculum & Research Projects

- Implementation and framework national qualification and national trade examination circulum
- Career Discovery Science Application and Engineering Electrical Combination Framework
- AI Fluency Program (collaboration with Sci-Bono ICT Academy)
- Smart Factory Enhanced with Artificial Intelligence (DL I4.0 FACTORY-AI)
- Advanced Didactic Laboratories & AI-Enhanced Systems

Patents & Formal Submissions

Type	Title/Focus	Application No.	Status
Patent	Engineering Master Doctoral (Rural Focus)	520520	Granted
Curriculum	Career Discovery… NSF Learning Journey	30	Granted
Framework	Security, Safety, Defense Facilitation…	520525	Granted

NotebookLM

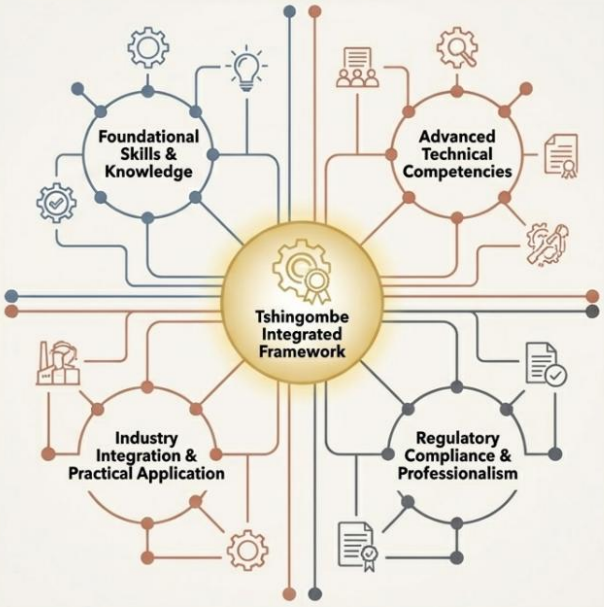
From a Fragmented System to an Integrated Future

The Challenge: A disconnected and outdated technical education system.

The Journey: A deliberate path of mastering foundational skills, building advanced systems, and engaging with the regulatory environment.

The Solution: The Tshingombe Integrated Framework—a proven, multi-layered model for developing the next generation of engineers.

This framework offers a clear, credentialed, and future-proof pathway to create a technically skilled workforce capable of building and maintaining South Africa's critical infrastructure.



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The Competency Profile of a Modern Engineer:
From Core Principles to Advanced Technology

Foundational Engineering & Education

National N Diploma in Engineering (NQF Level 6)

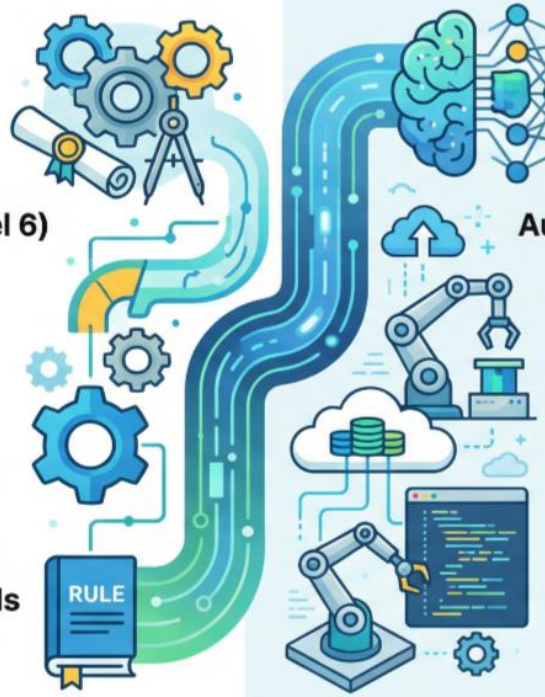
Completed N1-N6 certificates in Electrical Engineering under the SAQA/DHET framework.

Qualified Assessor & Moderator

Expertise in South African assessment policies (ICASS) and curriculum engineering.

Expertise in Military & International Standards

Deep knowledge of MIL-STD-810 (Environmental Testing) and IEC 62368-1 (Safety).



Advanced Technical & Modern Skills

Proficient in AI & Automation Technologies

Skilled in Agentforce (Salesforce) and GitHub Copilot tools for code development.

Certified on Industry-Leading Platforms

Includes training from Schneider Electric, Eaton, and Salesforce Trailhead.

Skills in Modern Software Development

Completed modules in C# programming and GitHub administration via Microsoft Learn.

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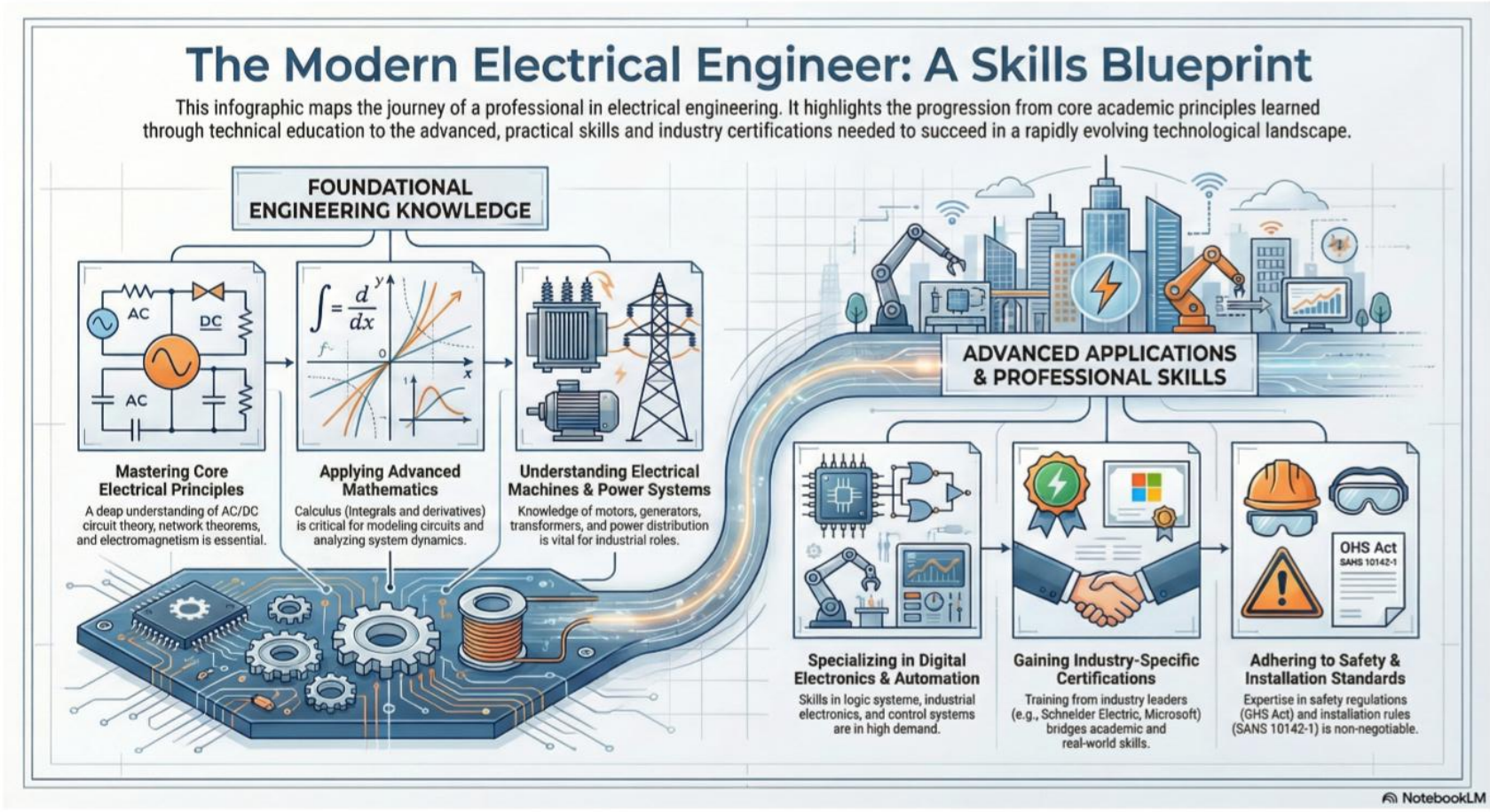
The Modern Electrical Engineer: A Skills Blueprint
This infographic maps the journey of a professional in electrical engineering. It highlights the progression from core academic principles learned through technical education to the advanced, practical skills and industry certifications needed to succeed in a rapidly evolving technological landscape.
FOUNDATIONAL ENGINEERING KNOWLEDGE
AC
DC
AC
Mastering Core Electrical Principles
A deap understanding of AC/DC circuit theory, network theorems, and electromagnetism is essential.
Applying Advanced Mathematics
Calculus (Integrals and derivatives) is critical for modeling circuits and analyzing system dynamics.
Understanding Electrical Machines & Power Systems
Knowledge of motors, generators, transformers, and power distribution is vital for industrial roles.
ADVANCED APPLICATIONS & PROFESSIONAL SKILLS
OHS Act
SANS 10142-1
Specializing in Digital Electronics & Automation
Skills in logic systeme, industrial electronics, and control systems are in high demand.
Gaining Industry-Specific Certifications
Training from industry leaders (e.g., Schnelder Electric, Microsoft) bridges academic and real-world skills.
Adhering to Safety & Installation Standards
Expertise in safety regulations (GHS Act) and installation rules (SANS 10142-1) is non-negotiable.
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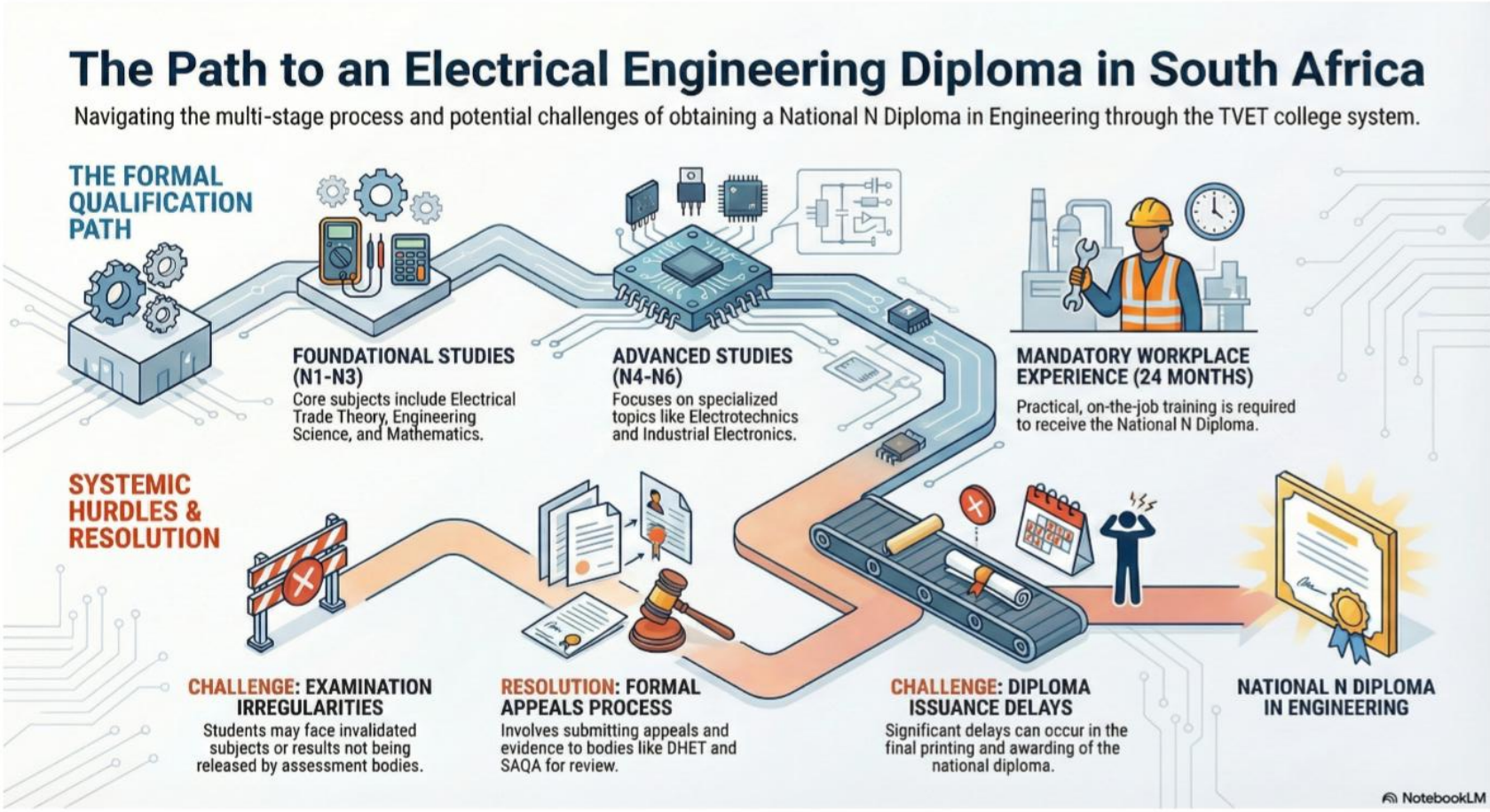
The Path to an Electrical Engineering Diploma in South Africa
Navigating the multi-stage process and potential challenges of obtaining a National N Diploma in Engineering through the TVET college system.
THE FORMAL QUALIFICATION PATH
FOUNDATIONAL STUDIES (N1-N3)
Core subjects include Electrical Trade Theory, Engineering Science, and Mathematics.
ADVANCED STUDIES (N4-N6)
Focuses on specialized topics like Electrotechnics and Industrial Electronics.
MANDATORY WORKPLACE EXPERIENCE (24 MONTHS)
Practical, on-the-job training is required to receive the National N Diploma.
SYSTEMIC HURDLES & RESOLUTION
CHALLENGE: EXAMINATION IRREGULARITIES
Students may face invalidated subjects or results not being released by assessment bodies.
RESOLUTION: FORMAL APPEALS PROCESS
Involves submitting appeals and evidence to bodies like DHET and SAQA for review.
CHALLENGE: DIPLOMA ISSUANCE DELAYS
Significant delays can occur in the final printing and awarding of the national diploma.
NATIONAL N DIPLOMA IN ENGINEERING
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A Systems Approach to Engineering Compliance and Educational Integrity
Synthesizing Military-Grade Standards with National Qualification Frameworks to Build Repeatable, Auditable Systems for Quality Assurance.
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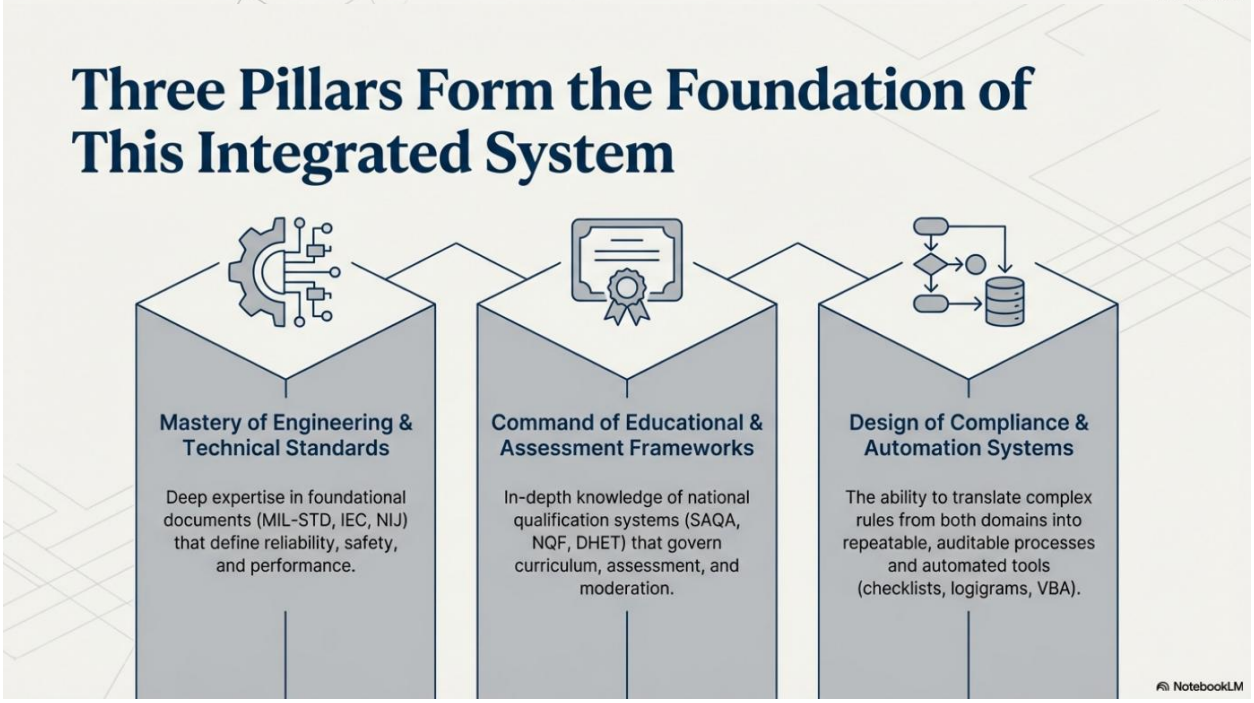
Three Pillars Form the Foundation of This Integrated System
Mastery of Engineering & Technical Standards
Deep expertise in foundational documents (MIL-STD, IEC, NIJ) that define reliability, safety, and performance.
Command of Educational & Assessment Frameworks
In-depth knowledge of national qualification systems (SAQA, NQF, DHET) that govern curriculum, assessment, and moderation.
Design of Compliance & Automation Systems
The ability to translate complex rules from both domains into repeatable, auditable processes and automated tools (checklists, logigrams, VBA).
NotebookLM

Mastery of Foundational Engineering Standards is the Bedrock of System Reliability

MIL-STD-11991B

Governs Parts, Materials, and Processes (PM&P) for military systems, ensuring reliability, authenticity, and lifecycle management of components, including COTS items.

MIL-STD-202G

Defines test methods for electronic and electrical component parts, covering environmental stresses like thermal shock, vibration, and moisture resistance.

MIL-STD-810H

The standard for environmental engineering considerations and laboratory tests, ensuring equipment can survive its service life in harsh conditions (temperature, shock, humidity).

MIL-STD-100G & IEC 62368-1

Establishes engineering drawing practices for the DoD, ensuring traceability and control, while IEC 62368-1 provides a hazard-based approach to product safety for commercial electronics.

NIJ 0101.06

The U.S. National Institute of Justice standard for ballistic resistance of body armor, defining test methods and performance requirements.

NotebookLM

Rigorous Incoming Inspection Protocols Translate Standards into Actionable Quality Control

Table: PM&P Incoming Inspection Data Requirements (Appendix H, H.2.1)

Requirement	EEE parts	Mechanical parts	Materials	Key Notes
Database fields (life of program)	Yes	Yes	Yes	Lot date code, P.O. requirements, C of C data
Documented procedures	Yes	Yes	Yes	Must define sampling, methods, acceptance criteria
Radiological inspection (X-ray)	As applicable	Yes	—	Verifies internal defects
DPA (Destructive Physical Analysis)	Cat. A–B required	—	—	Not a standalone counterfeit test; see MIL-STD-1580
PIND (Particle Impact Noise)	Cat. A–C, T	—	—	Detects loose particles in hermetic devices
XRF (X-ray fluorescence)	Yes	—	—	Checks for coating/material discrepancies (e.g., pure tin)
Certificate of Conformance (C of C)	Yes	Yes	Yes	Must be traceable and verifiable

Why It Matters

These protocols are the first line of defense against counterfeit parts and component failure, ensuring that every part entering the supply chain is authentic, traceable, and meets specification.

NotebookLM

Applying Derating Factors is Critical for Ensuring Long-Term Component Reliability

Microcircuit Derating Factors (Table AVI)	
Max Supply Voltage	0.90 (Digital), 0.80 (Linear)
Power Dissipation	0.80 (Digital), 0.75 (Linear)
Max Junction Temp	40°C below max rating

Capacitor Derating Factors (Table AI)	
Voltage Derating Factor	0.50 (for Ceramic, Glass, Film, Mica, Tantalum)
Max Case Temperature	20°C below max rating (most types)
Aluminum Electrolytic	Not allowed

EMI Filter Derating Factors (Table AIV)	
Rated Current	0.75
Rated Voltage	0.50
Max Operating Temp	30°C below manufacturer's max

Optoelectronic Device Derating Factors (Table AVII)	
Power Dissipation	0.50
Forward Current / Voltage	0.70
Max Temperature	30°C below max

Why It Matters

Derating is a proactive engineering practice that prevents premature failure by ensuring components operate well below their maximum stress limits. This is fundamental to building systems that are not just functional, but survivable.

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A Rigorous Command of National Educational Frameworks Ensures Qualification Integrity

Key Regulatory Bodies

department higher education
Department
Higher Education and Training
REPUBLIC AFRICA

Sets policy and oversees TVET colleges.

SAQA — Manages the NQF and ensures quality and standardization.

QCTO — Manages occupational qualifications.

The National N Diploma Pathway (SAQA ID 90674 / NQF Level 6)

Requires completion of **N4**, **N5**, and **N6** certificates plus **24 months** of relevant practical experience. N4-N6 subjects build from foundational to advanced topics.

N4	N5	N6	
Mathematics, Engineering Science, Industrial Electronics	Electro-technics, Digital Electronics, Power Machines	Supervisory Management, Control Systems, Installation Rules	**National N Diploma**

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Detailed Knowledge of Assessment Policy is Essential for Fair and Valid Moderation

ICASS (Internal Continuous Assessment) Structure

Component	Weighting	Notes
Test 1	30%	Covers first 30% of syllabus
Test 2	70%	Covers 75-80% of syllabus

A minimum ICASS mark of **40%** is required to qualify for the final exam.

Final Examination Rules (Example: Electrical Trade Theory)

Cognitive Weighting

- Knowledge: 60%
- Understanding: 20%
- Application: 15%
- Evaluation: 5%

Module Weighting (N1 Electrical Trade Theory)

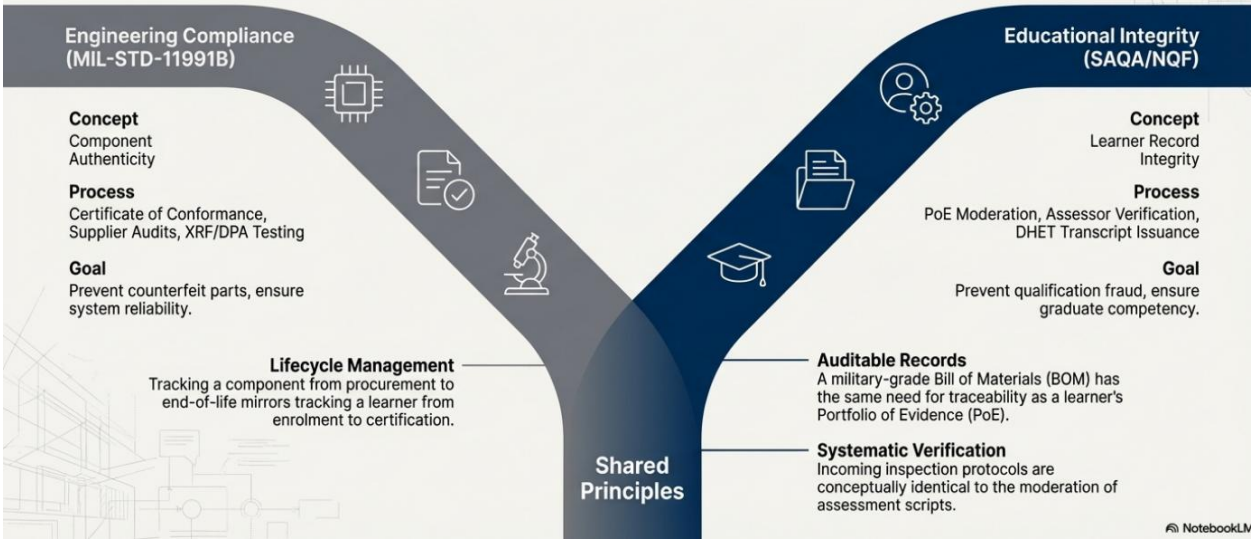
- DC Theory: 30%
- Wiring of premises: 25%
- Safety precautions: 10%
- Other modules: 35%

Why It Matters

A granular understanding of these weightings is critical for designing fair assessments, moderating results effectively, and ensuring that learner outcomes align precisely with the curriculum's objectives.

NotebookLM

Engineering Principles of Traceability and Validation Directly Translate to Educational Quality Assurance

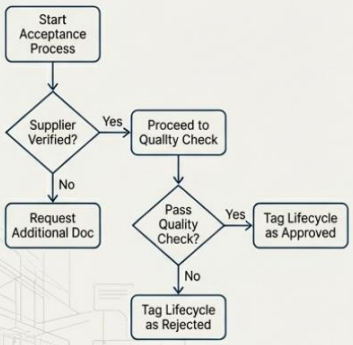

Engineering Compliance (MIL-STD-11991B)
Concept
Component Authenticity
Process
Certificate of Conformance, Supplier Audits, XRF/DPA Testing
Goal
Prevent counterfeit parts, ensure system reliability.
Lifecycle Management
Tracking a component from procurement to end-of-life mirrors tracking a learner from enrolment to certification.
Shared Principles
Auditable Records
A military-grade Bill of Materials (BOM) has the same need for traceability as a learner's Portfolio of Evidence (PoE).
Systematic Verification
Incoming inspection protocols are conceptually identical to the moderation of assessment scripts.
Educational Integrity (SAQA/NQF)
Concept
Learner Record Integrity
Process
PoE Moderation, Assessor Verification, DHET Transcript Issuance
Goal
Prevent qualification fraud, ensure graduate competency.

NotebookLM

Complex Compliance Requirements are Managed by Building Repeatable, Auditable Systems

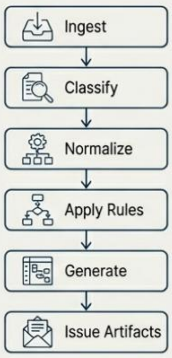
Logigrams (Logic Diagrams)

Use Case: Mapping decision flows for complex processes.



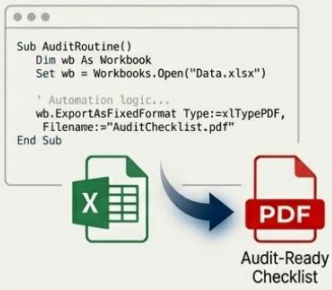
Algorigrams (Algorithm Diagrams)

Use Case: Representing sequential audit routines and workflows.



Visual Basic for Applications (VBA) Modules

Use Case: Automating data-intensive tasks in MS Office.



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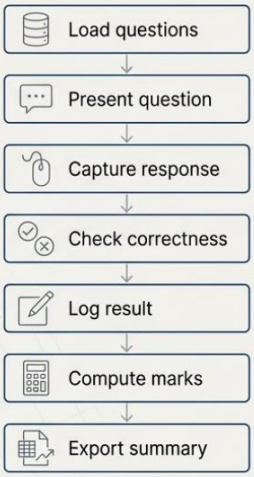
Automation Translates Theory into Practical Tools for Assessment and Auditing

Quiz Process



VBA Module Structure

Data Model (`modQuiz`)

```
Public Type QuizItem
    Id As Long
    Question As String
    Options(1 To 4) As String
    CorrectOptionIndex As Integer
    Explanation As String
End Type
```

Controller (`RunQuiz`)

Manages the quiz flow, prompting for input and scoring responses.

User Interface (`frmQuiz`)

A user form with controls (labels, option buttons, command buttons) to present the quiz visually.

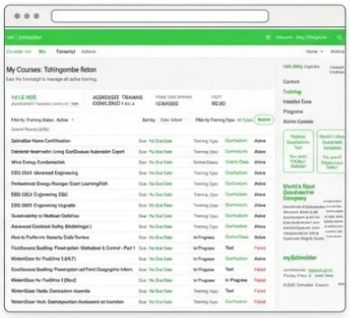
Export (`modExport`)

```
ws.Range("A1:E1").Value = Array("ItemId", "SelectedIndex",
"IsCorrect", "Timestamp", "Explanation")
```

NotebookLM

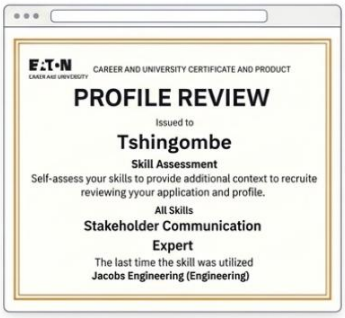
Expertise is Applied Across Corporate Training, Public Utilities, and Global Engineering Firms

Schneider Electric



Demonstrates commitment to continuous professional development with a leading global specialist in energy management and automation.

Eaton



Shows active engagement and skill validation with a major multinational power management company.

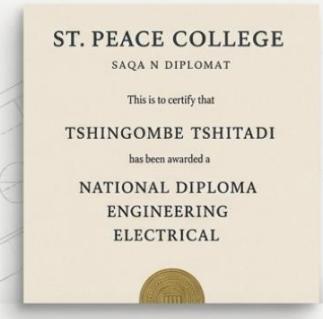
Eskom & City Power

Eskom
City Power
Activities: Submission of applications for technical and training roles (e.g., "Snr Technician," "Officer Education and Training"). Research conducted on-site at City Power by NATED engineering students to align curriculum with practical industry needs.
Eskom Career SERAPS Certificate Award
TSHINGOMBE TSHITADI

Highlights involvement with key public utility providers, including role applications and practical research partnerships.

NotebookLM

Formal Qualifications and Certifications Validate Both Technical Mastery and Assessment Authority



department higher education
SAQA
CERTIFICATE AND DIPLOMA
This is to certify that
TSHINGOMBE TSHITADI
has satisfied the following whereupon
CERTIFICATE AND DIPLOMA
is hereby awarded
NQF LEVEL | SUBJECT | RESULT
N1 | Mathematics | Passed
N2 | Engineering Science | Passed
N3 | Electrical Trade Theory | Passed
N4 | Electrotechnics | Passed
N8 | Industrial Orientation | Passed
N8 | Industrial | Passed
N6 | Plant | Passed

- Achieved National N Diploma in Electrical Engineering, the culmination of N1-N6 theoretical studies and practical experience.
- Certified as a Moderator and Assessor by SASSETA, a formal designation of competence in educational quality assurance.
- Transcript records from DHET and SAQA provide a fully auditable trail of academic progress and achievement.

NotebookLM

Systematic Documentation and Compliance Expertise are Deployed to Navigate Complex Legal and Regulatory Challenges

CCMA and Labour Court Proceedings

- **Issue:** Unfair dismissal claims and arbitration.
- **Action:** Filed formal arbitration requests (e.g., LRA Form 7.13, Case Ref GAJB6808-15) and navigated procedural requirements.
- **Outcome:** Demonstrates proficiency in compiling and submitting evidence-based legal documentation.

PSIRA Complaint Records

- **Issue:** Filed against a security employer regarding provident fund contributions.
- **Action:** Submitted 'Special Complaint Form' referencing the Levies Collective Agreement (Gazette No.42975).
- **Outcome:** Shows application of regulatory knowledge to hold organizations accountable to statutory obligations.

SAPS & Civil Cases

- **Context:** Documentation of witness statements and point-out notes at Hillbrow SAPS; management of civil cases through the court system.
- **Outcome:** Highlights meticulous record-keeping and evidence management in formal investigations.

NotebookLM

A Comprehensive Portfolio of Evidence Substantiates Expertise Across All Domains

Engineering & Technical Standards

- Analysis reports on MIL-STD-11991B, MIL-STD-202G, MIL-STD-810H, IEC 62368-1.

Demonstrates: Deep knowledge of reliability, testing, and safety protocols.

Formal Academic & Professional Qualifications

- National N Diploma (Electrical Engineering), DHET/SAQA Transcripts (N1-N6), SASSETA Assessor/Moderator Certificate.

Demonstrates: Certified mastery of engineering curriculum and educational assessment.

Corporate & Industry Engagement

- Schneider Electric & Eaton training transcripts, Eskom & SARB application records, City Power site visit reports.

Demonstrates: Application of skills in leading corporate and public sector environments.

Regulatory & Legal Documentation

- CCMA arbitration filings, PSIRA complaint forms, SAPS witness statements, Labour Court records.

Demonstrates: Ability to apply systematic, evidence-based principles in high-stakes disputes.

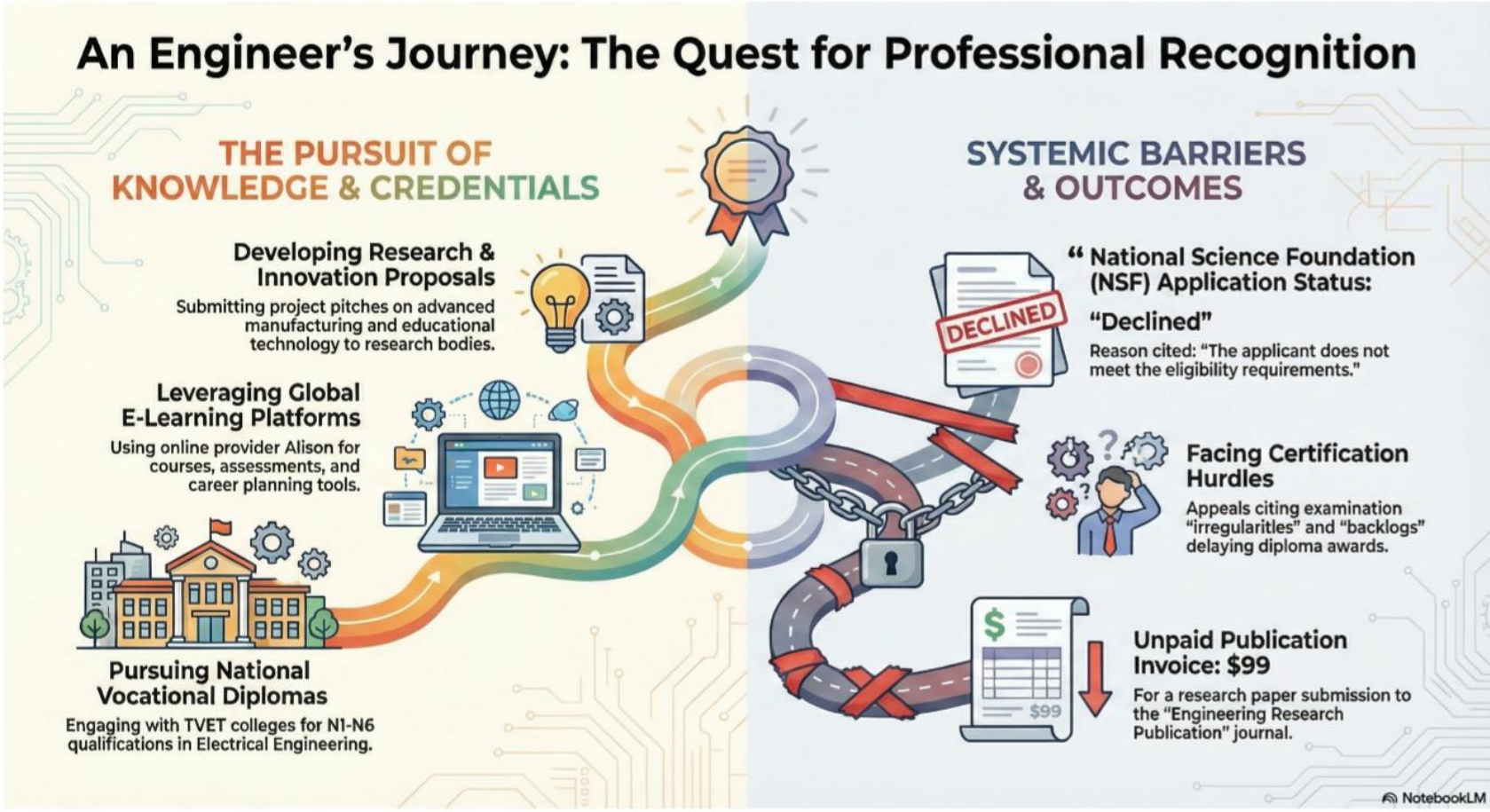
NotebookLM

The Synthesis of Engineering Rigor and Educational Principle Creates Systems That Build Trust and Guarantee Quality

The discipline required to ensure a military-grade component is authentic is the same discipline needed to validate a learner's qualification. Both demand a system built on clear standards, rigorous verification, and auditable evidence. By integrating the principles of high-reliability engineering with the frameworks of national education, we can build robust, repeatable systems that ensure integrity —whether that integrity is in a circuit board on a battlefield or in a diploma hanging on a wall.

NotebookLM

The Engineer's Dual Challenge:
Navigating Technical Mastery and Bureaucratic Hurdles
THE TECHNICAL MOUNTAIN: ACHIEVING MASTERY
AI
Your Diploma is Just the Tutorial Level
Continuous learning and certifications in AI, cloud computing, and cybersecurity are vital.
Industry-Standard Competencies are Essential
Industry-grade Electronics
Mastery must span industrial automation, power systems, and military-grade electronics standards.
Technical is the New Theoretical
Vocational engineering requires advanced calculus, physics, and complex problem-solving skills.
THE BUREAUCRATIC MAZE: OVERCOMING OBSTACLES
THE BUREAUCRATIC OBSTACLES
CONFLUENCE
LEGAL
The True Curriculum is Industry Integration
Success requires aligning skills with partners while managing compliance and documentation.
00:09
Systemic Failures are a Key Obstacle
Professionals face multi-year certification backlogs, exam irregularities, and invalidated results.
REJECTED
The Real Final Boss is Bureaucracy
Administrative hurdles from qualification authorities often overshadow technical challenges.
NotebookLM


An Engineer's Journey: The Quest for Professional Recognition
THE PURSUIT OF KNOWLEDGE & CREDENTIALS
SYSTEMIC BARRIERS & OUTCOMES
Developing Research & Innovation Proposals
Submitting project pitches on advanced manufacturing and educational technology to research bodies.
Leveraging Global E-Learning Platforms
Using online provider Alison for courses, assessments, and career planning tools.
Pursuing National Vocational Diplomas
Engaging with TVET colleges for N1-N6 qualifications in Electrical Engineering.
DECLINED
" National Science Foundation (NSF) Application Status:
"Declined"
Reason cited: "The applicant does not meet the eligibility requirements."
Facing Certification Hurdles
Appeals citing examination "irregularitles" and "backlogs" delaying diploma awards.
$
$99
Unpaid Publication Invoice: $99
For a research paper submission to the "Engineering Research Publication" journal.
NotebookLM

The Competency Profile of a Modern Engineer:
From Core Principles to Advanced Technology

Foundational Engineering & Education

National N Diploma in Engineering (NQF Level 6)

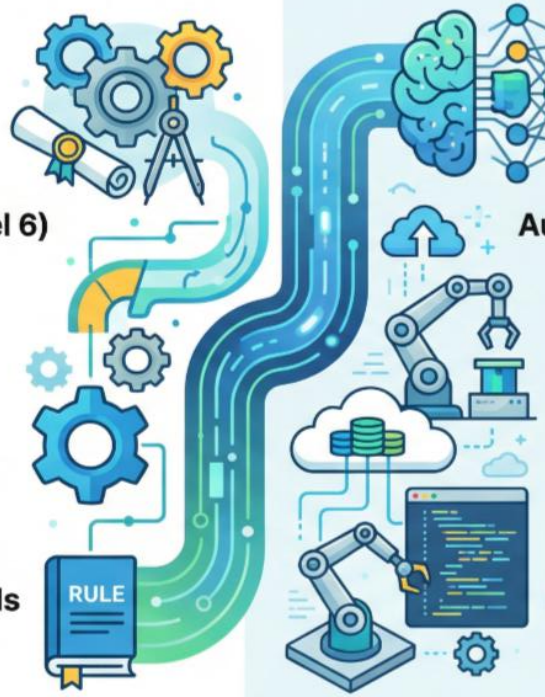
Completed N1-N6 certificates in Electrical Engineering under the SAQA/DHET framework.

Qualified Assessor & Moderator

Expertise in South African assessment policies (ICASS) and curriculum engineering.

Expertise in Military & International Standards

Deep knowledge of MIL-STD-810 (Environmental Testing) and IEC 62368-1 (Safety).



Advanced Technical & Modern Skills

Proficient in AI & Automation Technologies

Skilled in Agentforce (Salesforce) and GitHub Copilot tools for code development.

Certified on Industry-Leading Platforms

Includes training from Schneider Electric, Eaton, and Salesforce Trailhead.

Skills in Modern Software Development

Completed modules in C# programming and GitHub administration via Microsoft Learn.

NotebookLM

The Expertise Framework: Synthesizing Electrical Mastery, Systems Integration, and Pedagogical Innovation

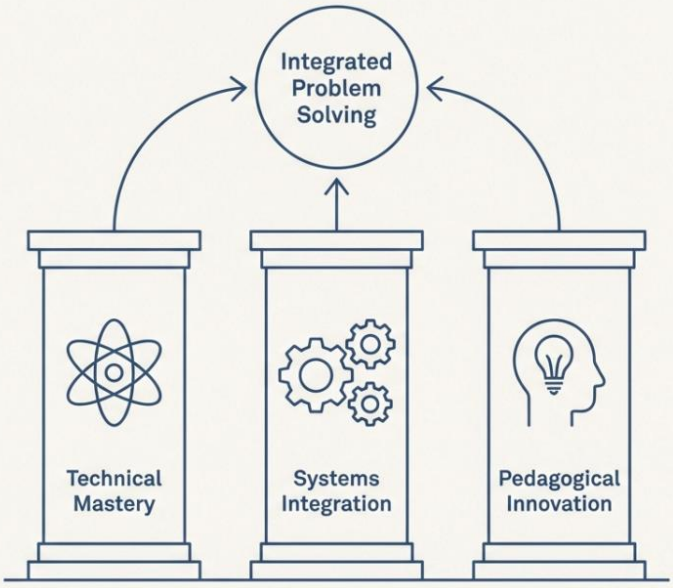
A presentation on a unified model for solving complex 21st-century socio-technical challenges.

NotebookLM

The framework was deliberately constructed to bridge deep theory with practical application.

This presentation outlines a unique, multi-disciplinary framework developed over years of rigorous study, practical application, and systemic analysis. It is not a chronological resume, but a blueprint of capability.

The framework integrates foundational engineering science, macro-level systems management, and innovative educational design to create holistic, sustainable solutions.



NotebookLM

Foundational expertise is rooted in a comprehensive N1-N6 engineering curriculum.

A deep, theoretical understanding of electrical and electronic principles forms the core of the framework. This knowledge, acquired through the NATED N1-N6 program, covers the full spectrum from basic circuit theory to advanced industrial electronics.

Key Subjects

- Electrical Trade Theory (N1-N3)
- Electrotechnics (N4-N6)
- Industrial Electronics (N4-N6)
- Engineering Science (N4)
- Mathematics (N4-N6)

Proof Point

AC Circuit Analysis

Calculation of impedance in complex RLC circuits using the formula:

$$Z = \sqrt{R^2 + (X_L - X_C)^2}$$

Proof Point

Instrument Analysis

Derivation of full-range voltage in measuring instruments:

$$V = V_m (1 + R_{se}/R_m)$$

Proof Point

Electromagnetism

Application of Faraday's Law to calculate induced EMF:

$$e = d/dt(Li)$$

NotebookLM

Technical proficiency is continuously updated with industry-standard certifications and tools.

Beyond foundational academics, expertise is maintained and expanded through targeted training with global technology leaders. This ensures skills remain current and aligned with the latest advancements in IT, cloud computing, power systems, and cybersecurity.

Microsoft

Certifications

- Introduction to Data Engineering on Azure
- Configure Network Security
- Perform Device Investigation in Microsoft Defender for Endpoint

Credential ID

MCID 995871759

Schneider Electric

Training

- Ecostruxure Power: Energy Modeling and Verification
- Drives Fundamentals of Kinematic Calculation
- Secure Power Virtual Certification

Practical Application

Bill of Materials for a Modicon M340 processor and a variable speed drive (ATV 12Hu22M2)

(ISC)²

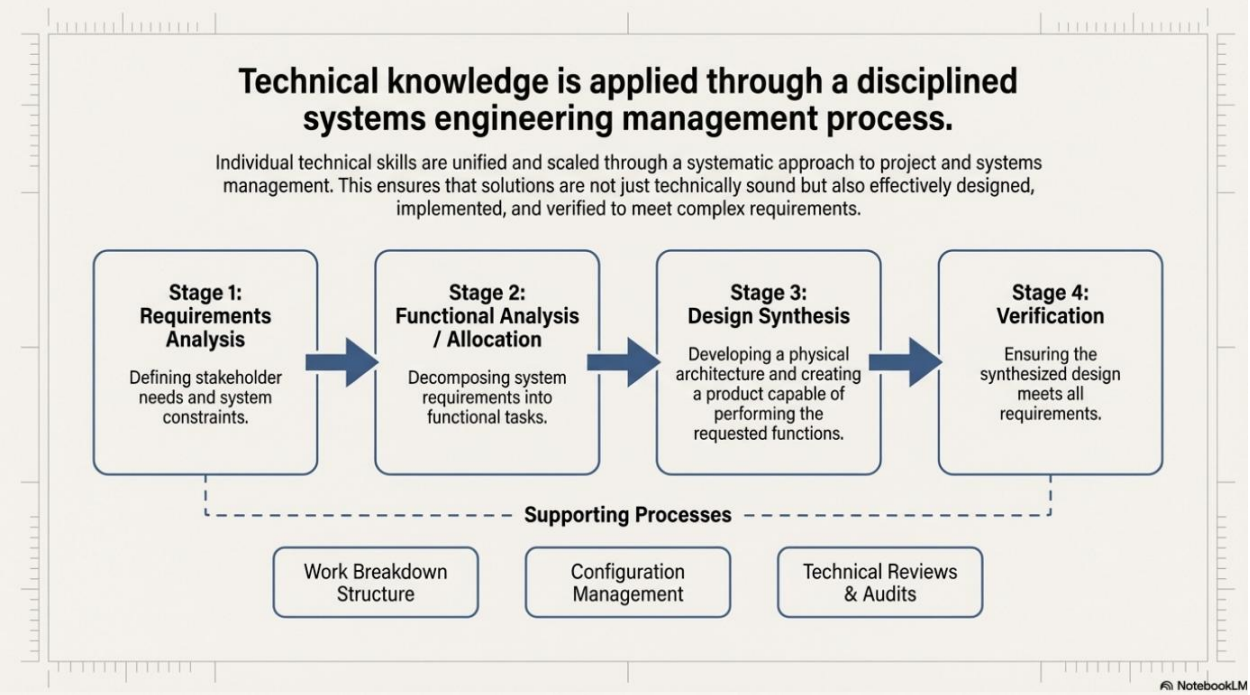
Certification

(ISC)² Certified in Cybersecurity

ID

6743edd3-32d3-474c-a802-b9cfe8e2f3

NotebookLM


Technical knowledge is applied through a disciplined systems engineering management process.
Individual technical skills are unified and scaled through a systematic approach to project and systems management. This ensures that solutions are not just technically sound but also effectively designed, implemented, and verified to meet complex requirements.
Stage 1: Requirements Analysis
Defining stakeholder needs and system constraints.
Stage 2: Functional Analysis / Allocation
Decomposing system requirements into functional tasks.
Stage 3: Design Synthesis
Developing a physical architecture and creating a product capable of performing the requested functions.
Stage 4: Verification
Ensuring the synthesized design meets all requirements.
Supporting Processes
Work Breakdown Structure
Configuration Management
Technical Reviews & Audits
NotebookLM

The framework is applied to design and optimize critical public infrastructure systems

The systems approach has been successfully applied to model and propose solutions for law enforcement and traffic management, demonstrating the capability to handle large-scale, data-intensive public systems.

Police Management Information Systems

Designing Real-Time Crime Record Management for National Security

Key Features

- Use Case Diagrams, Entity-Relation Diagrams, Data Flow Diagrams (DFD), installation of LAN/WAN topologies, establishment of a central data center

Objective

To create an e-government police system that is public-accessible, reduces crime, and increases citizen safety.

Traffic Systems Management

A Systematic Process for Traffic Signal Installation and Management

Process Steps

1. Candidate Site Identification
2. Warranty Study
3. Signal Design (including geometric improvements)
4. Installation
5. Commissioning

Key Tool

Use of a detailed checklist for approving traffic signal designs by a registered professional engineer.

NotebookLM

Systems thinking drives innovation in industrial automation and secure financial processing.

The framework's principles have been used to propose industrial research programs, configure automated systems, and work within the highly secure environment of the national reserve bank.

DTIC THRIP Proposal

Tshingombe Tshitadi Engineering

Implementation of a framework circuit college for a Master's degree qualification in Electrical Engineering, targeting government systems assessment with City Power & Eskom.

Requested amount:
R20,000,000

SARB (South African Reserve Bank)

Bank Note Processor

Department: Cash Center, JHB

Involved analysis of high-speed banknote processing machines (1200 notes/min) and ATM technology.

City Power

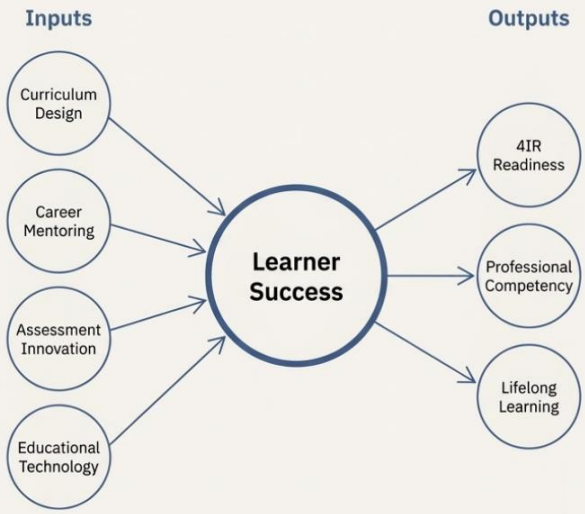
Practical experience with metering systems, including building-mounted meter bases near the service entrance.

Work involved standards like IEC 62053-22 (Electricity metering equipment) and SANS 10142-1.

NotebookLM

A commitment to education involves designing and delivering modern technical curricula.

True expertise includes the ability to transfer knowledge. This pillar focuses on creating innovative educational frameworks, mentoring the next generation of engineers, and leveraging technology to make learning more effective and accessible. The approach is grounded in outcome-based education and andragogic (adult learning) principles.



NotebookLM

The Scie-Bono Discovery Centre serves as a laboratory for career mentoring and STEM engagement.

As a facilitator and mentor at the Scie-Bono Discovery Centre, the goal is to prepare learners for participation in the 4th Industrial Revolution (4IR) by providing exposure to coding, robotics, nanotechnology, and career readiness skills.

Career & Study Skills

CV Writing, Time Management, Job Search Skills

4IR Technologies

Robotics, Coding (C++, Python), 3D Design, IoT Essentials

Nanotechnology Workshops

"Nanotechnology and Water," "Nanotechnology and Mining," "Nanotechnology and Energy."

Hands-on Experiments

Building graphite circuits to test resistance, designing posters on gas sensors for mines

Key Partners: Department of Education, Eskom, City Power

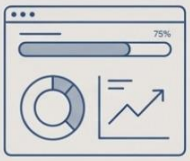
NotebookLM

Innovative assessment models and digital platforms are leveraged to ensure quality and learner success.

Moving beyond traditional testing, this approach uses modern assessment tools to provide a holistic view of competency. This includes structured rubrics, digital portfolios, and learner dashboards for real-time feedback, aligning with frameworks from bodies like the SQA (Scottish Qualifications Authority).

Criterion	Very Satisfactory (25)	Satisfactory (18.75)	Competent (12.5)	Deficient (0)
Problem Solving	Analyzes complex issues and develops innovative solutions.	Solves problems effectively with minor guidance.	Applies standard procedures to solve routine problems.	Fails to identify or solve problems.
Application of Theory	Seamlessly integrates theory into practical, novel applications.	Correctly applies theoretical concepts to given tasks.	Demonstrates basic understanding of theoretical application.	Unable to connect theory to practice.
Practical Implementation	Executes tasks flawlessly with high precision and efficiency.	Completes tasks to a good standard with minimal errors.	Completes tasks but may require correction or supervision.	Fails to complete practical tasks.

Digital tools like Learner Dashboards visualize progress, achievements, and areas for improvement, providing actionable insights to both learners and educators.



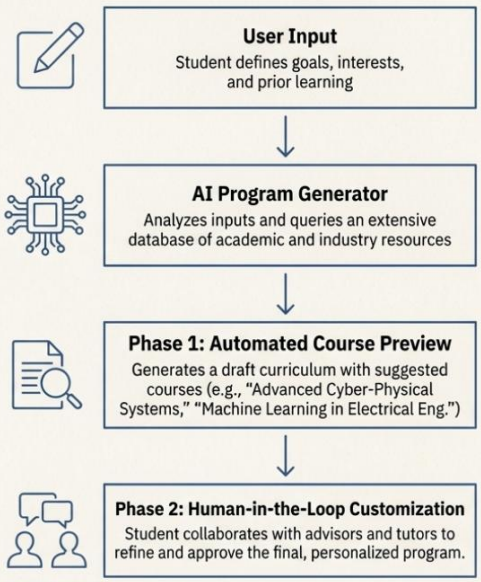
NotebookLM

The future of pedagogy is explored through the application of AI in personalized curriculum design.

Leveraging Generative AI to create bespoke academic programs that reflect a student's professional goals and personal vision. This approach, exemplified by the AIU AI Program Generator, represents the frontier of educational technology, emphasizing self-directed, industry-aligned learning.

Open Curriculum

Students are empowered to define their own courses, drawing from AIU's database, external resources, or entirely new proposals.


User Input
Student defines goals, interests, and prior learning
AI Program Generator
Analyzes inputs and queries an extensive database of academic and industry resources
Phase 1: Automated Course Preview
Generates a draft curriculum with suggested courses (e.g., "Advanced Cyber-Physical Systems," "Machine Learning in Electrical Eng.")
Phase 2: Human-in-the-Loop Customization
Student collaborates with advisors and tutors to refine and approve the final, personalized program.

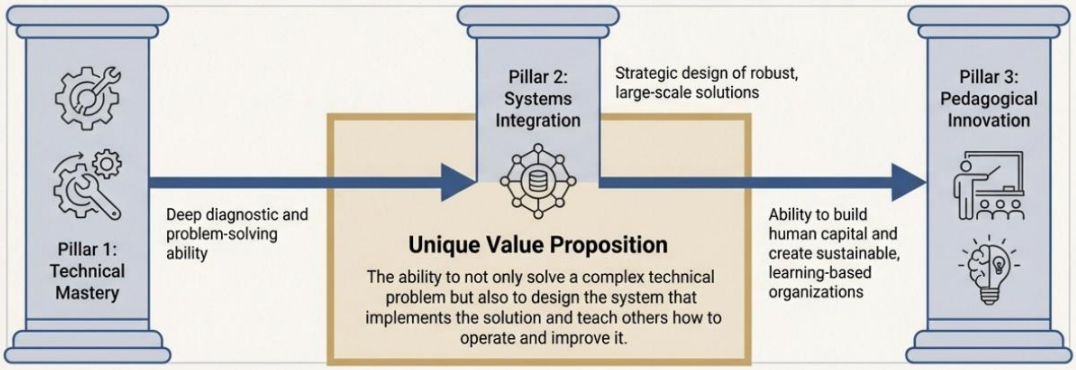
NotebookLM

Navigating systemic challenges in qualification recognition has forged a resilient and advocacy-driven approach.

The journey to build this framework has included significant challenges in getting formal qualifications (N1-N6, Diplomas, Degrees) recognized by bodies such as SAQA and DHET. These protracted disputes, involving the CCMA and Labour Court (e.g., Case JR 2461/15), were not setbacks. They became a real-world curriculum in **systemic analysis, legal frameworks,** and the critical importance of **verifiable, competency-based evidence.**

NotebookLM

The three pillars converge to create a unique capability: a systems architect for complex socio-technical challenges


Pillar 1: Technical Mastery
Deep diagnostic and problem-solving ability
Pillar 2: Systems Integration
Strategic design of robust, large-scale solutions
Unique Value Proposition
The ability to not only solve a complex technical problem but also to design the system that implements the solution and teach others how to operate and improve it.
Ability to build human capital and create sustainable, learning-based organizations
Pillar 3: Pedagogical Innovation

The framework is more than a collection of skills; it is an integrated process for analysis, design, and implementation. It combines the 'what is possible' of engineering, the 'how to achieve it' of systems management, and the 'how to scale it' of education.

NotebookLM

This expertise framework is a living model for solving future problems in smart infrastructure, sustainable energy, and lifelong education.

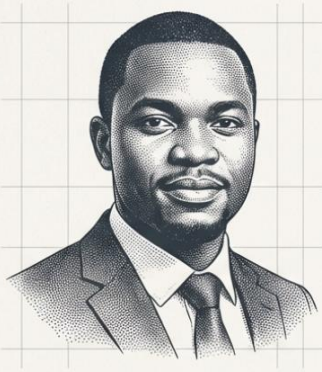
The challenges of tomorrow—from integrating renewable energy into smart grids to developing secure cyber-physical systems and fostering an adaptable workforce—require a multi-disciplinary approach. The Expertise Framework is designed not for the problems of the past, but as an adaptive tool for the opportunities of the future.

Smart Infrastructure

Sustainable Energy

Lifelong Education

NotebookLM



Fiston Tshingombe Tshitadi: Engineer. Systems Architect. Educator.

A multi-disciplinary professional with proven expertise in:

- **Electrical & Electronics Engineering**: N1-N6, Power Systems, Industrial Automation, Digital Systems.
- **Systems Engineering & Management**: Public Infrastructure (Policing, Traffic), Industrial Controls, Financial Systems.
- **Education & Curriculum Development**: STEM Mentoring, AI-driven Pedagogy, Competency-based Assessment.

tshingombefiston@gmail.com

t5h2i0tadi/tshingombe-enginerig-data-science-sarb-

View Verifiable Credentials

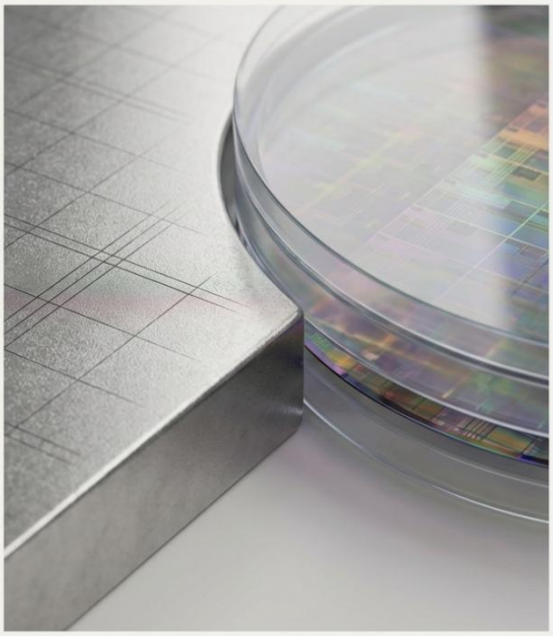
NotebookLM

ENGINEERING THE CONVERGENCE OF PHYSICAL INFRASTRUCTURE AND DIGITAL INTELLIGENCE

A Portfolio of Evidence for Solving Complex, Interconnected Systems Challenges

The critical challenges of the 21st century exist at the intersection of atoms and bits. Securing our energy grids, optimizing manufacturing, and building sustainable infrastructure now demands a holistic understanding of electrical engineering, artificial intelligence, and cybersecurity.

This portfolio demonstrates a purpose-built expertise, meticulously developed to operate at this convergence.



Tshingombe Tshitadi Fiston

NotebookLM

A MULTI-PILLAR APPROACH TO SYSTEMS ENGINEERING

Mastery in the modern era requires deep, specialized knowledge across four integrated domains. Each pillar represents a foundational block of expertise, from the principles of power to the architecture of future technologies.

Pillar I: Power & Electrical Systems

Pillar II: Software, Data & AI

Pillar III: Cybersecurity & Resilient Systems

Pillar IV: Emerging & Frontier Technologies

NotebookLM

PILLAR I: FOUNDATIONAL MASTERY IN ELECTRICAL & POWER SYSTEMS

A comprehensive command of the physical layer, from generation and transmission to infrastructure and control. This expertise forms the bedrock for designing and managing modern energy systems.

Key Areas of Study

- **Doctorate-Level Focus**: Specialist Engineering in Infrastructure and Contractors: Electrical Engineering.
- **Power Systems**: Advanced Power System Analysis, Smart Grids & IoT Applications, High Voltage Engineering.
- **Renewable Energy**: Sustainable Electrical Engineering Practices, Solar/Wind Energy Systems, Clean Energy Technology.
- **Infrastructure**: Electrical Systems in Construction & Civil Engineering, Electrical Infrastructure Design & Management.
- **Control Theory**: Electrotechnical studies in AC/DC machines, motor control, and excitation.

Tangible Proof: Technical Calculations

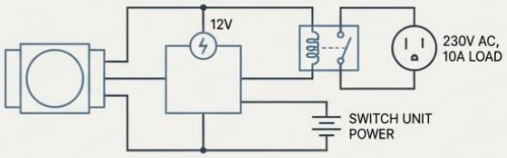
$$h_{plant} = \frac{ms\ (h4-h1)}{m_f \times h_{v.}} . \frac{\times 100}{1} = 83{,}25\%$$

$$V_{mean} \text{ at } 0° = \sqrt{2/2\pi \times V_{RM} \times (1+\cos \text{ alpha })} = 108{,}038v$$

NotebookLM

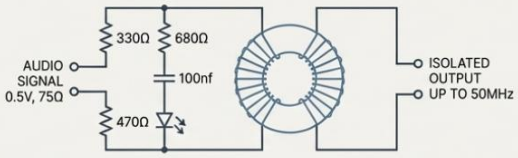
FROM THEORY TO TANGIBLE APPLICATION: A PORTFOLIO OF PRACTICAL PROJECTS

Knowledge is validated through application. This selection of projects demonstrates hands-on experience in circuit design, component selection, and system construction for real-world sensing and control applications.



PIR-Triggered Mains Switch

- **Objective:** Design a motion-activated switch for a 230V AC outlet with a 10A load limit.
- **Key Components:**
  - PIR detector with 20m range
  - Regulated 12V power circuit
  - UB2-size plastic box housing
  - 20A-rated relay contacts
  - Unregulated 17V DC power for virtual contacts
- **Function:** Senses movement to switch mains power, with battery operation for the switch unit itself.



Audio Converter Prototype & Lab Testing

- **Objective:** Design and build a circuit to convert and couple audio signals.
- **Key Components:**
  - Resistors: 330 ohm, 680 ohm, 470 ohm
  - Capacitor: 100nf
  - Semiconductors: Standard yellow LED
  - Coupling Transformer: Toroidal core for signals up to 50Mhz
- **Function:** Provides galvanized isolation and impedance matching for audio signals (0.5V and 75ohm).

NotebookLM

PILLAR II: ARCHITECTING THE DIGITAL LAYER WITH SOFTWARE, DATA & AI

Building on the physical foundation, this pillar represents mastery over the software, data, and intelligence that drive modern systems. Expertise spans from software engineering fundamentals to the implementation of advanced AI solutions on cloud platforms.

Key Areas of Study

- **Software Engineering**: Principles of Software Engineering Basics, C# & Java Programming, Immutable Data Storage Solutions.
- **Data Management**: Database management (Oracle, SAP), SQL Server Migration & Optimization, Azure Cosmos DB fundamentals.
- **Artificial Intelligence & Machine Learning**: Building AI solutions **solutions** with Azure OpenAI Service, training regression, classification, and deep learning models.
- **Cloud & Enterprise Platforms**: Salesforce Trailblazer development, Azure AI Search, Microsoft Copilot Studio.

Recent Certifications (Microsoft Learn)

- **AI Skills Challenge:** Build next generation apps with Azure OpenAI (47% completed)
- Assess SQL Server databases for migration to Azure SQL (Completed 11/20/2023)
- Train and evaluate deep learning models (Completed 11/9/2023)

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PILLAR III: SECURING THE SYSTEM WITH A CYBERSECURITY & RESILIENCE FRAMEWORK

As systems converge, their attack surfaces expand. This expertise focuses on designing resilient infrastructure by integrating security at every layer, from network protocols to data privacy and regulatory compliance.

Key Areas of Study & Engagement

- **Cyber-Physical Systems (CPS) Security:** Analysis of security and privacy vulnerabilities in integrated physical and computational systems.
- **Infrastructure Security:** Cybersecurity in Smart Infrastructure, Network Security Essentials for Digital Libraries, Access Control in Library Networks.
- **Data Integrity & Privacy:** Immutable Data Structures, Digital Rights Management, Data Privacy in Distributed Ledger Technology (DLT).
- **Governance, Risk & Compliance (GRC):** Engagement with ISC² (International Information Systems Security Certification Consortium), including a proposal for Security Congress 2025 on "Framework Qualification Education Technology".
- **Threat Detection:** Analysis of ICT security procedures, prevention/recovery strategies, and identification of potential risk areas.

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PILLAR IV: ENGINEERING FOR THE NEXT FRONTIER WITH EMERGING TECHNOLOGIES

Solving tomorrow's problems requires an understanding of tomorrow's tools. This pillar represents a deep engagement with paradigm-shifting technologies poised to redefine systems engineering.

Quantum Computing & Advanced Systems

* Quantum Computing in Systems Engineering:
  * Introduction to Quantum Algorithms & Information Theory
  * Quantum Gates, Circuits, and Programming Languages
  * Analysis of Quantum Supremacy and its implications
* Autonomous Systems:
  * Advanced Studies in Autonomous Vehicles and Drones
  * Machine Learning & AI for Autonomous Systems
  * Sensor Technologies and Data Processing

Biotechnology & Advanced Manufacturing

* Synthetic Biology & Genetic Engineering:
  * Fundamentals of DNA sequencing and CRISPR
  * Applications in Urban Agriculture and Vertical Farming
  * Biopharmaceutical and Advanced Manufacturing Techniques
* Distributed Ledger Technology (DLT):
  * Blockchain for Secure Credentialing
  * Smart Contracts in Educational & Supply Chain Transactions

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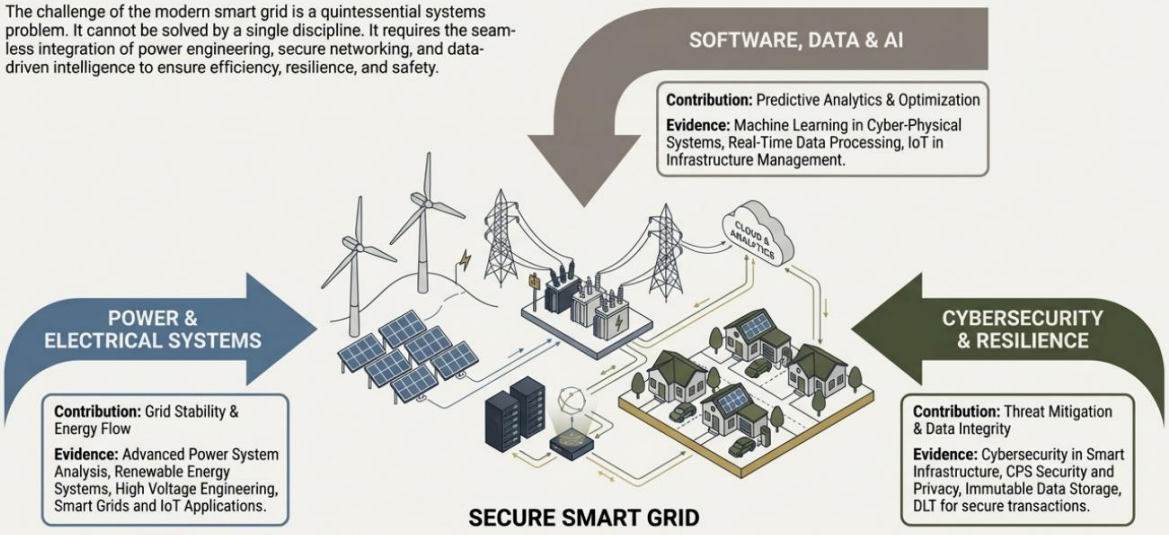
SYNTHESIS: A UNIFIED APPROACH TO DESIGNING SECURE AND INTELLIGENT SMART GRIDS

The challenge of the modern smart grid is a quintessential systems problem. It cannot be solved by a single discipline. It requires the seamless integration of power engineering, secure networking, and data-driven intelligence to ensure efficiency, resilience, and safety.


SOFTWARE, DATA & AI
Contribution: Predictive Analytics & Optimization
Evidence: Machine Learning in Cyber-Physical Systems, Real-Time Data Processing, IoT in Infrastructure Management.
POWER & ELECTRICAL SYSTEMS
Contribution: Grid Stability & Energy Flow
Evidence: Advanced Power System Analysis, Renewable Energy Systems, High Voltage Engineering, Smart Grids and IoT Applications.
CLOUD & ANALYTICS
CYBERSECURITY & RESILIENCE
Contribution: Threat Mitigation & Data Integrity
Evidence: Cybersecurity in Smart Infrastructure, CPS Security and Privacy, Immutable Data Storage, DLT for secure transactions.
SECURE SMART GRID

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BEYOND THE TECHNOLOGY: INTEGRATING ENGINEERING WITH MANAGEMENT, POLICY, AND LAW

Effective implementation requires more than technical acumen. It demands an understanding of the supply chains, project management frameworks, and regulatory environments that govern industries.

Key Competencies

Industrial Engineering & Supply Chain
* Masters in Supply Chain Management and Traceability
* Wholesale Trade Management, Procurement Strategies, Inventory Control
* Blockchain for Supply Chain Traceability, IoT and Smart Supply Chains

Project & Production Management
* Project Management in Electrical Engineering
* Supervision and Management in Industrial Operations
* Computer Integrated Manufacturing (CIM), CAD, Bill of Materials

Legal & Regulatory Frameworks
* Knowledge of SAQA, NQF, and DHET frameworks
* Analysis of labor relations, industrial law, and apprenticeship contracts
* Understanding of safety regulations and security procedures

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THE INTERDISCIPLINARY SYSTEMS ENGINEER: READY FOR THE CONVERGENT FUTURE

The evidence presented demonstrates a rare and deliberate combination of capabilities:

- Deep technical mastery in the foundational science of electrical and power engineering.
- Proven fluency in the modern languages of software, data, and artificial intelligence.
- A strategic mindset for securing complex systems and anticipating future technological shifts.
- Resilience and drive to apply this knowledge to the world's most critical infrastructure challenges.

This is not a collection of disparate skills, but a unified portfolio engineered to solve the problems of an interconnected world.

Tshingombe Tshitadi Fiston

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An Integrated Framework for South Africa's Vocational Future

Bridging Policy, Industry, and Academia in Engineering Education

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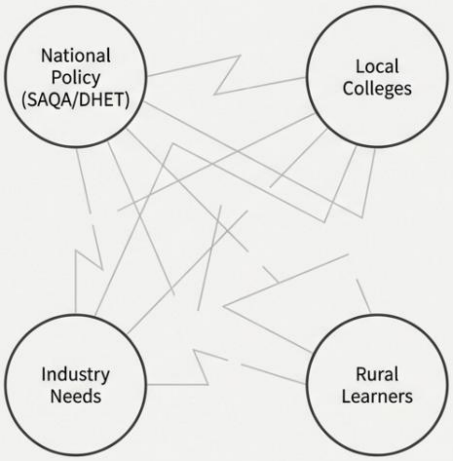
South Africa's Vocational Education System is Characterized by Systemic Fragmentation



A chasm exists between national frameworks and local college needs, undermining the quality and credibility of our vocational qualifications.

"Systemic gaps in the training, assessment, and qualification process, particularly in rural areas or places with economic instability."

"Policy discrepancies... hinder effective implementation at the college level."

"Backlog in qualification verification and certification issuance."

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A System Under Strain: Four Key Frictions

Policy-Practice Disconnect

National frameworks like the NQF are not agile enough to meet the specific needs of local institutions, leading to implementation challenges and qualification mismatches.

The Geographic Disparity

Rural institutions face critical limitations in resources, qualified teaching staff, and infrastructure, creating significant irregularities in access and educational outcomes compared to urban centers.

Industry-Academia Misalignment

A persistent gap between classroom learning and real-world application leaves graduates without the practical skills demanded by key sectors like energy and manufacturing.

Inconsistent Quality Assurance

A lack of standardized training for lecturers in assessment, coupled with infrastructure issues, leads to irregular examination schedules and compromises the credibility of qualifications.

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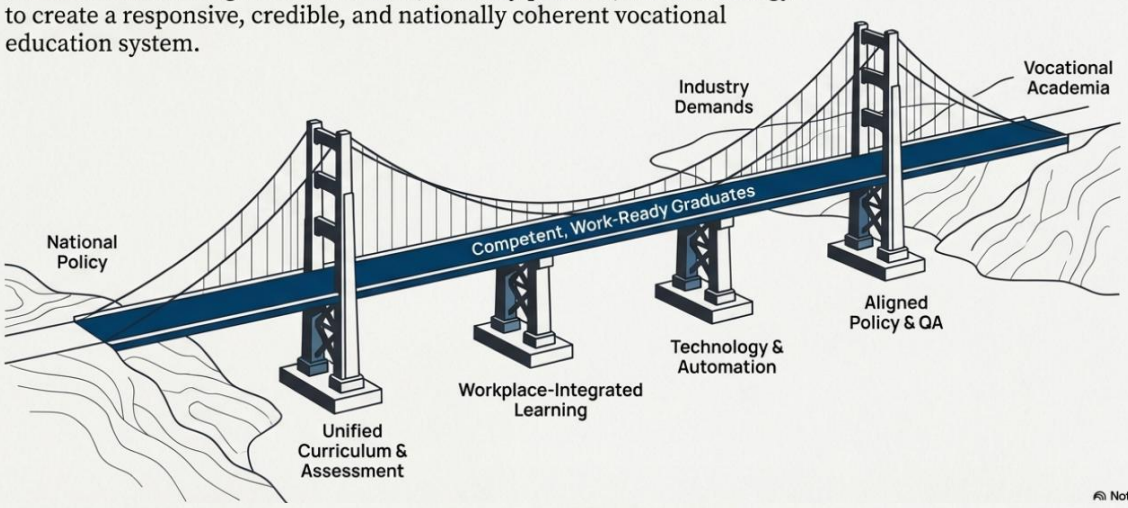
The Solution: A Unified Competency Framework for Engineering Trades

This framework integrates curriculum, industry practice, and technology to create a responsive, credible, and nationally coherent vocational education system.



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Pillar 1: A Unified Curriculum Built on Rigorous Engineering Principles

Advanced Theoretical Core

From Electrotechnics N6 Syllabus

- Line Frequency Phase Controlled Rectifiers
- DC-DC Switch Mode Converters
- Pulse-Width Modulation (PWM)
- Three-phase systems and transformers

Mathematical Foundations

Core Power System Formulae

$$S = P + jQ$$

$$|S| = \sqrt{P^2 + Q^2}$$

Power Factor: $\cos(\theta) = \frac{P}{|S|}$

$$P = \sqrt{3} \times V_l \times I_l \times \cos(\theta)$$

Structured Learning Pathways

SAQA NQF Alignment

Title	Details
Qualification	National Certificate: Electrical Engineering
Level & Credits	NQF Level 3, 133 Credits
Structure	Core, Fundamental, and Elective Components
Specializations	Mining, Renewable Energy, Electrical Construction

Unified Curriculum & Assessment

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Grounding Theory in Practice Through Modern Assessment

Quality-Assured Assessment Design

Pre-Assessment Moderation (From Annexure G2)

- ☐ Conceptual level indicated per question
- ☐ Clear and unambiguous instructions
- ☐ Task fits within allocated time
- ☐ Formula sheets / Addenda attached

A Field-Based Competency Model

Research Design Principle

> "Develop a model that includes both academic and practical assessments, allowing for an integrated approach to evaluating students' engineering competencies."

Automation for Transparency & Efficiency

System Logic for Promotion

```
' Promotion Eligibility
Sub CheckPromotion(ICASS As Double,
   ExamMark As Double)
   Dim PromotionMark As Double
   PromotionMark = (ICASS * 0.4) +
      (ExamMark * 0.6)
   If PromotionMark >= 40 Then
      MsgBox "✅ Eligible for promotion"
   Else
      MsgBox "❌ Not eligible – improve
        marks"
   End If
End Sub
```

Unified Curriculum & Assessment

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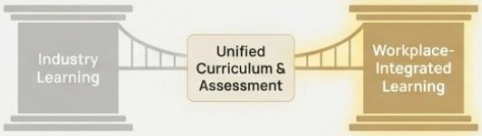
Pillar 2: Forging the Industry-Academia Bridge Through Integrated Learning



The framework moves beyond theoretical knowledge by embedding structured, real-world industry experience as a non-negotiable component of qualification.

Evidence Panel 1

Mandated Workplace Experience

Official regulation
Requires proof of **24 months of workplace experience** in a relevant engineering environment. A logbook with tasks, dates, and supervisor signatures must be submitted with the diploma application.

Evidence Panel 2

Industry-Led Training Modules

Schneider Electric

- Industrial automation and Programmable Logic Controllers (PLCs)
- PLC fundamentals and Modicon ranges
- Troubleshooting skills for industrial systems

Evidence Panel 3

Real-World Case Studies

Real-world scenarios will be presented, such as city power systems (**City Power**), industrial control challenges (**Eskom**), and load shedding analysis.

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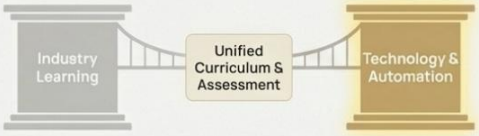
Pillar 3: Technology as the Systemic Enabler for Scale and Quality



Leveraging technology to automate administration, personalize learning, and bridge the resource gap for rural institutions.

Evidence Panel 1

Data-Driven Management Systems

field name	data type	description
product_id	text	number automatically assigned
supplier_id	number	links to supplier table
category_id	number	links to categories table
unit_price	currency	
units_stock	number	

Evidence Panel 2

Custom Automation Solutions

```
Type SubjectRecord
     Level As String
     SubjectCode As String
     SubjectName As String
     Mark As Integer
     Passed As Boolean
End Type
```

Evidence Panel 3

Enhancing Learner Access & Outcomes

"Enhance learner outcomes by introducing technological solutions that allow for more interactive and personalized learning experiences, especially in rural areas."

"Examine how virtual labs or mobile training units can supplement traditional vocational facilities."

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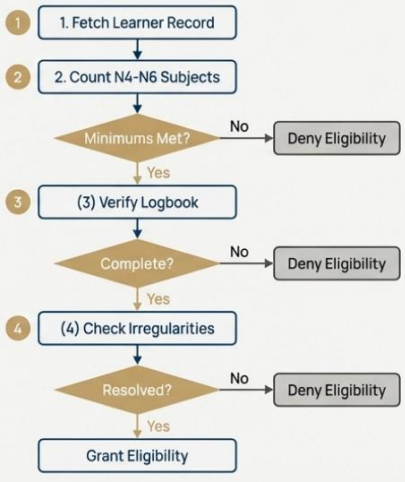
From Concept to Code: Automating Diploma Eligibility and Validation

To address administrative backlogs and ensure transparent, rule-based qualification awards, a custom validation engine was developed. This system automates the verification of subject completion, N-level requirements, and irregularity resolution.

```
' DHET Electrical Engineering Diploma Validator
Sub CheckDiplomaEligibility()
    Dim n4_passed, n5_passed, n6_passed As Integer
    Dim total_passed As Integer
    ' ... [code to loop through learner subjects] ...

1   ' 1. Counts passed subjects at N4, N5, and N6 levels.
    ' ...

2   ' 2. Checks for minimum subjects per level.
    If n4_passed < 4 Or n5_passed < 4 Or n6_passed < 4 Then
        EligibilityStatus = "Fail: Incomplete levels."
        Exit Sub
    End If

3   ' 3. Verifies workplace experience logbook status.
    If Learner.LogbookComplete = False Then
        EligibilityStatus = "Fail: Logbook pending."
        Exit Sub
    End If

4   ' 4. Confirms all irregularities are resolved.
    If Learner.IrregularityResolved = False Then
        EligibilityStatus = "Fail: Irregularity outstanding."
        Exit Sub
    End If

    EligibilityStatus = "Pass: Eligible for Diploma."
End Sub
```



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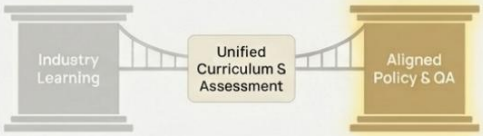
Pillar 4: Aligning Policy for National Impact and Credibility



The framework provides a blueprint for resolving policy disagreements and aligning national standards (DHET, SAQA) with the practical realities of college-level implementation.

Evidence Panel 1

Core Research Question

"How do policy discrepancies between national education frameworks (DHET, SAQA, etc.) and local college practices affect the quality and credibility of vocational qualifications?"

Evidence Panel 2

Key Stakeholders & Frameworks

SAQA QCTO UNESCO UNESCO-UNEVOC

Evidence Panel 3

Compliance and Recognition

The framework addresses challenges in foreign qualification assessment and ensures compliance with SAQA's March 2017 Policy Implementation, which sets requirements for recognizing qualifications from government-recognized institutions.

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A Framework That Fosters Innovation and Protects Intellectual Property

A modern educational system must not only transfer knowledge but also equip learners and institutions to create and protect novel solutions. The framework integrates principles of intellectual property to prepare for an innovation-driven economy.

What is a Patentable Invention?

Any novel and useful creation, process, machine, or composition. Scientific principles and business methods are not patentable.

Software

Software is protected by copyright, but can be patented if it solves a technical problem.

The Three Criteria for Patentability

1. Novelty
Must not be publicly disclosed before filing.

2. Utility
Must function and serve a useful purpose.

3. Inventive Step
Must not be obvious to a skilled professional.

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The Implementation Roadmap: A Phased Approach to Systemic Change

Year 1

Pilot & Refine

Action: Implement the integrated curriculum and assessment model in select Electrical Engineering programs at partner TVET colleges (one rural, one urban).

Goal: Validate the model, gather data on learner outcomes, and refine content based on feedback from lecturers and industry partners.

Year 2

Develop & Deploy Technology

Action: Build and deploy the core Assessment Management and Qualification Validation system based on the prototyped VBA logic. Integrate virtual lab components.

Goal: Streamline administrative processes, reduce backlogs, and provide a transparent platform for all stakeholders.

Year 3 onwards

Scale & Collaborate

Action: Establish a national TVET Forum for engineering trades, in collaboration with UNESCO-UNEVOC. Begin a phased national rollout of the framework and technology platform.

Goal: Promote system-wide adoption, facilitate knowledge sharing, and ensure the long-term sustainability and responsiveness of the system.

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Envisioned Outcomes: A Dynamic and Responsive National System

For Learners

Improved Graduate Employability

Graduates possess credible qualifications and the relevant, practical skills demanded by industry, leading to better employment opportunities.

For Industry

A Pipeline of Competent Talent

Strengthened partnerships ensure a reliable source of work-ready engineers, reducing in-house training costs and addressing critical skills shortages.

For Institutions

Enhanced Credibility and Efficiency

Reduced administrative backlogs, transparent assessment processes, and alignment with national standards bolster institutional reputation.

For South Africa

A Globally Competitive Workforce

A vocational system that effectively bridges the rural-urban divide and adapts to technological change, contributing to national economic sustainability.

Appendix: A Cross-Section of Integrated Technical Competencies

Core Electrical Engineering

- Power Systems & Solar Integration
- AC/DC Machine Analysis
- Transformer Sizing & Fault Analysis
- Circuit Protection (SANS 10142)
- PLC Programming

Digital & IT Integration

- Database Management (SQL)
- Visual Basic Automation
- Google Cloud & ICT Platforms
- Online Learning Management Systems (LMS)
- IoT & Sensor Integration

Workplace & Professional Skills

- ISO Compliance in Projects
- IP Licensing & Patent Criteria
- Project Management & Costing
- Technical Report Writing Writing
- SAQA/DHET Policy Navigation

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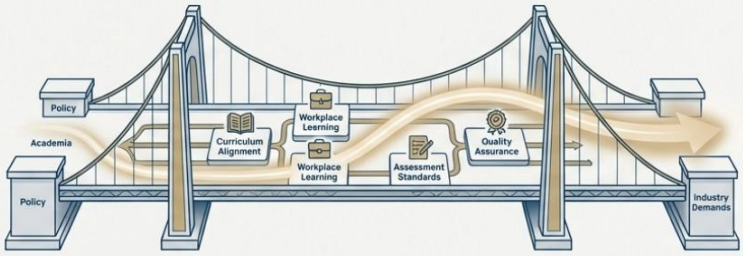

Building a Coherent Future, Together

The evidence is comprehensive. The model is robust. The need is urgent. This framework is more than a proposal; it is an engineered blueprint for a vocational education system that is equitable, efficient, and aligned with the future of South Africa. **It is time to build.**

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From Theory to Impact: The Professional Profile of Fiston Tshingombe Tshitadi
An Engineering Innovator Bridging Academics, Application, and Entrepreneurship
Academics
Application
Entrepreneurship
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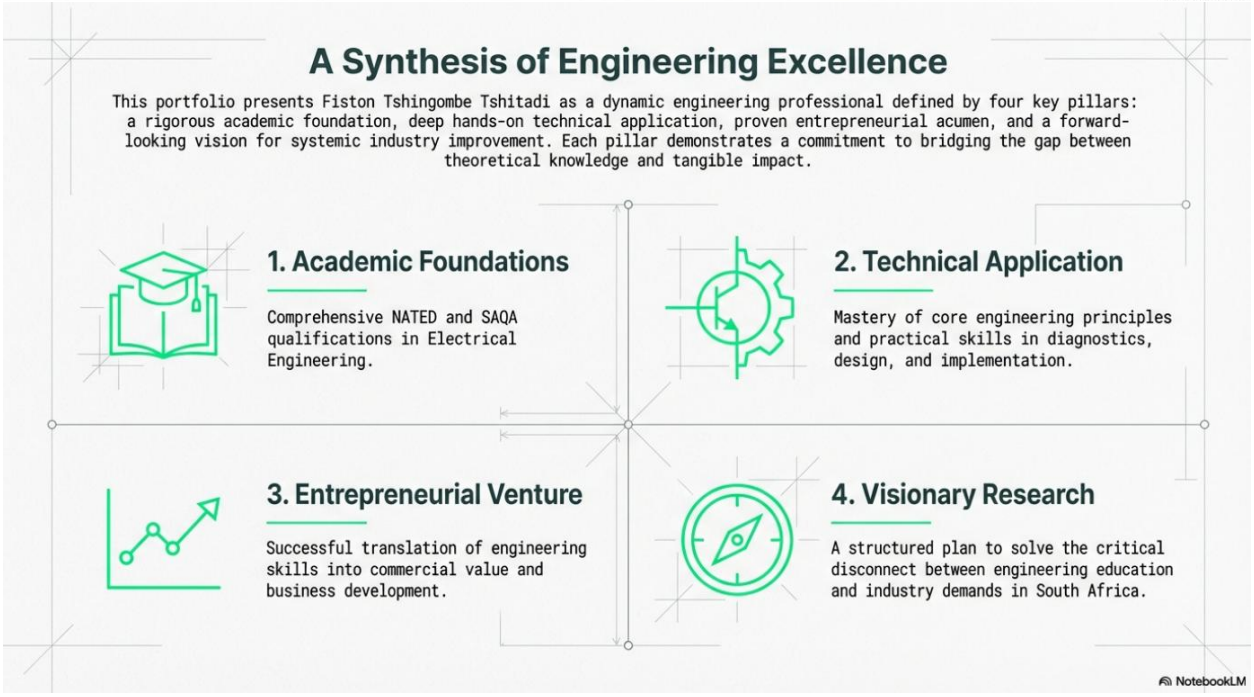
A Synthesis of Engineering Excellence
This portfolio presents Fiston Tshingombe Tshitadi as a dynamic engineering professional defined by four key pillars: a rigorous academic foundation, deep hands-on technical application, proven entrepreneurial acumen, and a forward-looking vision for systemic industry improvement. Each pillar demonstrates a commitment to bridging the gap between theoretical knowledge and tangible impact.
1. Academic Foundations
Comprehensive NATED and SAQA qualifications in Electrical Engineering.
2. Technical Application
Mastery of core engineering principles and practical skills in diagnostics, design, and implementation.
3. Entrepreneurial Venture
Successful translation of engineering skills into commercial value and business development.
4. Visionary Research
A structured plan to solve the critical disconnect between engineering education and industry demands in South Africa.
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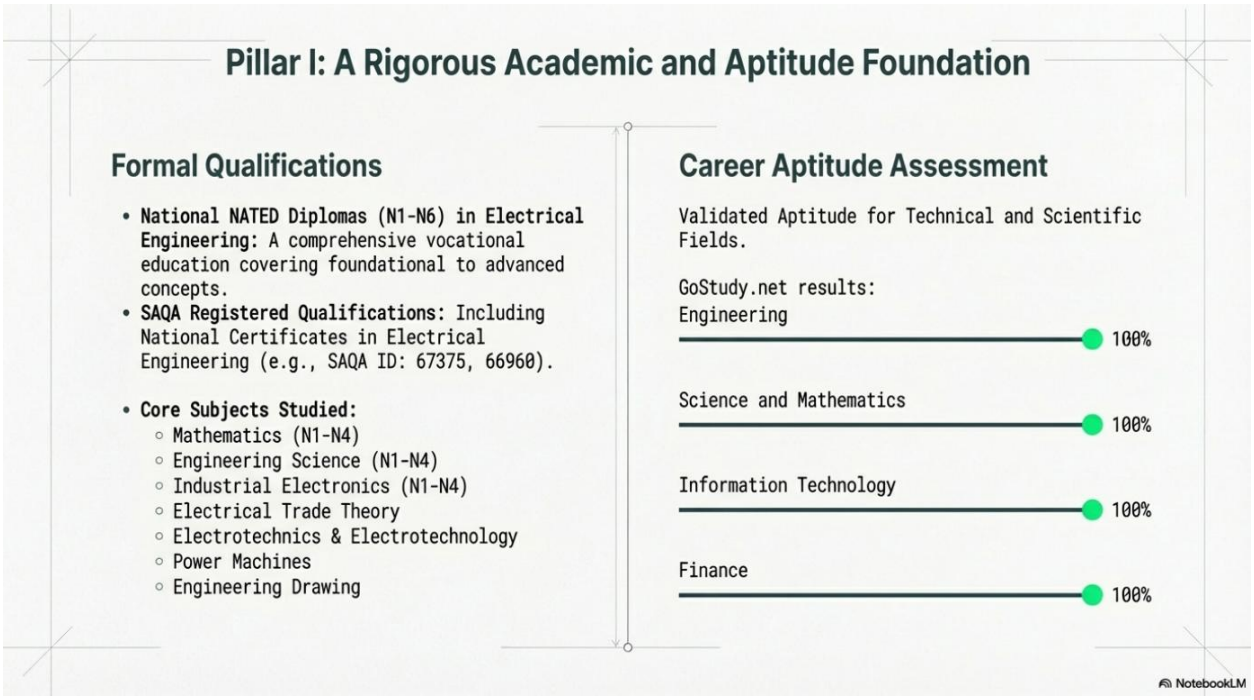
Pillar I: A Rigorous Academic and Aptitude Foundation
Formal Qualifications
National NATED Diplomas (N1-N6) in Electrical Engineering: A comprehensive vocational education covering foundational to advanced concepts.
SAQA Registered Qualifications: Including National Certificates in Electrical Engineering (e.g., SAQA ID: 67375, 66960).
Core Subjects Studied:
Mathematics (N1-N4)
Engineering Science (N1-N4)
Industrial Electronics (N1-N4)
Electrical Trade Theory
Electrotechnics & Electrotechnology
Power Machines
Engineering Drawing
Career Aptitude Assessment
Validated Aptitude for Technical and Scientific Fields.
GoStudy.net results:
Engineering
100%
Science and Mathematics
100%
Information Technology
100%
Finance
100%
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Pillar II: Mastery of Core Engineering Principles

A profound understanding of the mathematical and physical laws governing electrical systems is the bedrock of effective engineering. This selection of applied formulae demonstrates mastery across key domains.

Circuit Theory

Kirchhoff's Laws:

$$E_T = I_1 \cdot R_1 + (I_1 - I_2)R_3$$

Thévenin/Norton Equivalents

AC/DC Machines

Synchronous Motor Equations:

$$V = E_b + I_a(R_a + Jxs)$$

DC Motor Equations:

$$N = \frac{v - I_a R_a}{k \cdot \phi}$$

Transformers

Voltage Regulation:

$$\%\ \text{reg} = \frac{v_{(\text{no-load})} - v_{(\text{full load})}}{v_{(\text{no-load})}} \times 100\%$$

Turns Ratio:

$$\frac{N_1}{N_2} = \frac{V_1}{V_2}$$

Three-Phase Connections (Star-Delta)

Electromagnetism

Biot-Savart Law:

$$d\vec{B} = \frac{\mu_0 \cdot I\, d\vec{s} \times \hat{r}}{4\pi r^2}$$

Faraday's Law:

$$E = -\frac{\Delta\Phi}{\Delta t}$$

Calculus & Advanced Mathematics

Differential Equations:

$$\frac{dy}{dx} + P(x)y = Q(x)$$

Integration for Volume:

$$V = \int \pi[y(x)]^2\, dx$$

Limits:

$$\lim_{n\to\infty}\left(1 + \frac{1}{n}\right)^n = e$$

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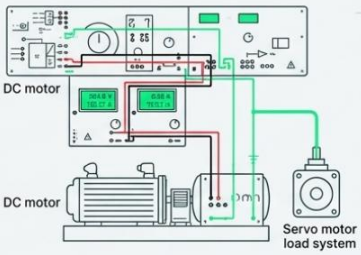
From the Lab to the Field: Applied Technical Expertise

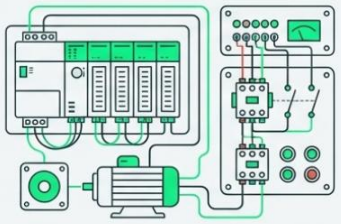
Practical Skills & Diagnostics

- **Motor Rewinding:** Detailed process knowledge, including stator analysis (e.g., `number of stator gaps z=24`, `width of slot b1=6,621mm`).
- **Fault Finding & Protection:** Expertise in control circuits, protective devices, fault discrimination, and compliance with installation rules (PVC, flexible conduit).
- **Installation & Compliance:** Deep familiarity with SABS/SANS standards (e.g., SANS 10142) for electrical installations, including distribution boards, circuit breakers, and earth leakage protection.



Laboratory & Didactic Experience

- **Hands-on Training:** Experience with advanced didactic training systems for electrotechnology, PLC, and motor control.
- **Key Experiments:**
  - Determination of Efficiency and Voltage Regulation of a single-phase Transformer by direct loading.
  - DC Shunt-Wound Motor 'Load characteristic' setup.
  - Power electronics labs using modular Lab-Volt and DSPACE equipment.



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